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IN THE

Supreme Court of the United States

October Term, 1967.

No. 249

ANCHOR HOCKING GLASS CORPORATION,
Petitioner,

v.

CORNING GLASS WORKS.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT.

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PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT.

ANCHOR HOCKING GLASS CORPORATION, your petitioner, prays that a writ of certiorari issue to review the judgment of the United States Court of Appeals for the Third Circuit, entered in the above-entitled case on March 20, 1967.

OPINIONS BELOW.

The opinion of the District Court (13a-47a; 245b-279b) is reported at 253 F. Supp. 461.[1] The opinion of the court below (Appendix A, *infra*, pp. A1-13) is reported at 374 F. 2d 473.

JURISDICTION.

The judgment of the court below (Appendix B, *infra*, p. A14) was entered on March 20, 1967. Jurisdiction of this Court is invoked under 28 U. S. C. § 1254(1).

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1. The record as printed for the court below consists of three volumes filed by respondent Corning Glass Works (hereinafter "Corning" throughout), which are paged consecutively with the suffix "a", and of two volumes filed by petitioner Anchor Hocking Glass Corporation (hereinafter "Anchor" throughout), which are similarly paged consecutively, but with the suffix "b".

Accordingly, every parenthetical record citation with the suffix "a" refers to Corning's Appendix, while every citation with the suffix "b" means Anchor's Appendix.

QUESTIONS PRESENTED.

1. Whether a limitation inserted into the claims of a patent in the course of their prosecution to distinguish over the prior art and to obtain their allowance, may, in the face of the doctrine of file wrapper estoppel, be excised from the claims by an appellate court to validate the patent.

2. Whether a patent is entitled to a wider and more liberal breadth of protection as a "pioneer patent" where the course of proceedings in the Patent Office shows a series of rejections of all claims by the examiner on the ground they were unpatentable over the prior art, each of which was followed by amendments to the patent application, some supported by affidavits of questionable accuracy, and in one instance by the personal intervention of a retired former immediate superior of the examiner, who had been retained as a consultant by the prospective patentee.

3. Whether, assuming that a patent so obtained is indeed a "pioneer patent", it is entitled to have its claims, which 35 U. S. C. § 112 requires to be definite, judged by a lower standard of definiteness than are other patents.

4. Whether, where the trial court found that the claims of a patent—which had been limited in the course of their prosecution to articles containing at least 50% crystals—were indefinite and invalid for failure to comply with 35 U. S. C. § 112 because "lengthy independent experimentation" was necessary to devise a test to determine whether the limitation was applicable, an appellate court may avoid the thrust of the statute by excising the limitation from the claims in order to validate the patent.

STATUTES AND RULE OF COURT INVOLVED.

1. Section 112 of 35 U. S. C. provides in pertinent part:

"§ *112. Specification.*

* * *

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

2. Section 282 of 35 U. S. C. provides in pertinent part:

"§ *282. Presumption of Validity; Defenses.*

The following shall be defenses in any action involving the validity or infringement of a patent and shall be pleaded:

* * *

(3) Invalidity of the patent or any claim in suit for failure to comply with any requirement of sections 112 or 251 of this title.

(4) Any other fact or act made a defense by this title."

3. Rule 52(a) of the Federal Rules of Civil Procedure provides in pertinent part:

"*Rule 52. Findings by the Court.*

(a) Effect. * * * Findings of fact shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses."

STATEMENT.

This case involves the validity of Stookey patent No. 2,920,971 (275a-283a; 281b-289b), issued to Corning January 12, 1960 on an application filed June 4, 1956. The patent is directed to a two-step heat treatment for crystallizing an endless variety of conventional glasses containing from 2-20% TiO_2 (titania). The first step is stated to produce invisible nuclei of TiO_2 throughout the glass and the second step, conducted at a somewhat higher temperature, causes crystallization on these nuclei of other crystallizable ingredients. All of the claims require at least 50% of the weight of the final product to be crystallized. The products produced by this treatment are asserted to have improved physical and dielectric properties. There are 21 patent claims, 11 directed to the two-step heat treatment and 10 to the resulting products (14a-15a, 16a; 246b-247b, 248b).

It should be noted here, by way of obviating any possible misunderstanding, that the patent in suit does not disclose either the specific glass composition or the specific heat treatment for making the widely advertised and commercially successful product CORNING WARE. But the extremely broad claims of this patent cover CORNING WARE and innumerable other products not yet developed. Both the formulation and the heat treatment used to produce CORNING WARE are based upon subsequent developments of other scientists covered by later patents not involved in this case (468b-469b; 44b-45b).

The District Court held the patent in suit invalid under 35 U. S. C. § 112 (*supra*, page 1) because, while the claim language of 50% crystallinity was not indefinite *per se*, percent crystallinity of the end product could not be measured accurately at the time the patent issued, and moreover "costly and lengthy independent experimentation" was necessary to devise a test to make this measurement (44a;

276b).[2] This measurement is required by all the claims in the patent. The District Court made the following key findings (44a-45a; 276b-277b):

> ". . . Even though the Patent Office did not require the 50% limitation in the patent, the patentee included this limitation and relied upon it to distinguish his patent from the prior art. Consequently, the public is entitled to experiment in this glass ceramic area and related fields up to the 50% crystallinity without being compelled to independently experiment to determine the limits of the patent claims."
>
> * * *
>
> "In 1956 two weeks before the patent application, Corning's records show that it was impossible to determine percent crystallinity by X-ray diffraction. In 1958 Corning was still unable to determine percent crystallinity of a glass ceramic by either X-ray diffraction or electron microscopy, although it was possible to determine this percentage roughly by chemical analysis. Finally, by 1964, with the help of new techniques which were developed after a year of independent experimentation, Corning's experts were able to make an estimate of the crystallinity in the glass ceramics within a 4 to 5% range of error. A description of this new technique was first published in 1964, about eight years from the time of the patent application and four years after it was issued."

The District Court went on to hold that, as a matter of law (44a-45a; 276b-277b):

> ". . . A patentee cannot foist a great financial burden on another to develop a new measurement tech-

2. But the District Court sustained the patent against contentions of lack of invention and novelty, and rejected as well Anchor's allegations of fraud, unclean hands, and inoperativeness (17a-41a; 249b-273b).

nique to determine whether he is infringing the patent."

Accordingly, since the District Court found that neither Corning nor Anchor was able, despite numerous expensive tests, to determine percent crystallinity within a 7 to 10% range of error, at the time the patent issued, the patent was held invalid (46a, 48a; 278b, 280b).

On appeal, the court below reversed—holding that the Stookey patent was a "pioneer patent", so it was entitled to a broader construction, and that accordingly "the District Court erred in finding Corning's patent to be unenforceable, since the standards placed upon this particular patent were, as a matter of law, too strict" (*infra*, p. A6).

The court below further held that "In interpreting the claims and specifications the District Court relied too heavily on the 50% crystallinity standard set forth in the patent" (*infra*, p. A9). In support, it cited Stookey's testimony that the percentage of crystallinity was not critical, and it expanded the scope of the claims so that the patent's sphere of protection will extend down to at least 40% crystallinity (*infra*, pp. A9-10). This reconstruction of the claim language supposedly overcame the 7-10% margin of error found by the trial court to be inherent in the crystallinity measurements (*infra*, A10-11).

Upon adopting this construction, the court below disagreed with the District Court's findings that the tests to determine crystallinity were difficult and expensive; held that the patent claims now complied with 35 U. S. C. § 112; sustained the Stookey patent against all contentions made against it; and reversed the judgment with instructions to consider the issue of infringement (*infra*, pp. A12-14).

Since the decision below depended in large part upon the court's characterization of the patent as a "pioneer", a brief discussion of the patent application history is in order.

A. Prosecution of Corning's Application Through the Patent Office.

Corning's application for the Stookey patent had a long path to tread after it reached the Patent Office in order to overcome the prior art. Before Corning was awarded a patent, there were no less than four rejections on the part of the Patent Office, which Corning met with six amendments to the application supported by numerous *ex parte* affidavits, and four personal interviews with the patent examiner (330b-332b; 333b-334b; 338b-346b; 362b).

1. *First rejection:* After the patent application was filed the patent examiner rejected the claims on March 7, 1957 as anticipated by the prior art (295b-297b) which included Corning's Armistead patent issued three years previously. The Armistead patent, like the patent at bar, describes a two-step heat treatment for crystallizing glasses containing from 8 to 25% TiO_2, the first step producing invisible nuclei of TiO_2, and the second step conducted at a higher temperature causing crystallization on these nuclei (401b-404b). Armistead's products are stated to have the ability to withstand higher temperatures than uncrystallized glasses (402b). The trial court found that Armistead's untreated compositions were included within the compositions of the patent in suit and if they were "held at the recrystallization temperature long enough" the products of the patent in suit could be formed (21a, 29a-30a; 253b, 261b-262b).

2. *First Amendment:* Corning amended its application on August 9, 1957, and sought to distinguish over the Armistead prior art by experiments reported in an affidavit of Dr. Witucki, one of its research chemists (298b-314b). The rejection on Armistead had been expected even before the Stookey application was filed and Witucki had conducted his affidavit experiments beforehand (472b; 14b; 115b-117b).

The Witucki affidavit was attacked by Anchor at the trial on the ground it was misleading. But the District Court found that this affidavit involved no intentional misstatements, however ambiguous or equivocal it might be because "It is a matter of opinion as to what the result proved" (31a; 263b) and "The implications of the affidavit are what the reader wishes to place there" (31a; 263b)—even though, contrary to the import of the affidavit, the Witucki experiment "departed from the actual heat treatment of an Armistead thermometer glass" (33a, N. 32; 265b N. 32).[3]

3. *Second Rejection:* Notwithstanding the foregoing amendment and request for reconsideration, the examiner once more rejected all the claims as unpatentable over the prior art, on April 1, 1958 (315b-317b).

4. *Second Amendment:* At this time Corning enlisted the services of a retired former immediate superior of the examiner, who studied the application file and recommended that to overcome the examiner's rejection all the claims should require the presence of at least 50% crystals (487b-491b). An amendment was prepared limiting all claims in this manner and urging that this limitation distinguished the claims from the prior art Armistead patent (381b-329b, 324b, 325b).

This amendment was filed in September, 1958. The following month, Corning's patent solicitor and the former superior of the examiner met with the examiner and attempted to convince him that the claims were patentable (237b, 239b-240b). In a post-interview supplementary amendment, Corning again stressed 50% crystallinity (330b-332b).

5. *Third Amendment:* After a second interview Corning further amended its application under date of

3. The District Court's statement that Anchor did not urge this point as a significant deviation overlooked page 20 of Defendant's Post-Trial Brief filed in the District Court.

March 16, 1959 (333b-334b), by designating it a "continuation in part" of an earlier Corning application.

6. *Third Rejection:* On May 13, 1959 the examiner withdrew his rejection of the claims as unpatentable over Armistead alone, but rejected them as unpatentable over a combination of Armistead and a newly cited reference—Watson (392b-394b). He relied on Armistead as showing the glass-making compositions covered by Stookey's claims were crystallizable, and he relied on Watson to show that the two-step heat treatment of the claims to produce crystallization was also old (335b-336b). The Watson patent described a method of subjecting basalt glasses to a two-step heat treatment to produce completely "devitrified [crystallized] articles without failure." The Watson patent further stated that these articles had improved strength and insulating qualities (392b-393b).

7. *Fourth Amendment:* Early in August, 1959, Corning filed another amendment to overcome the newly cited Watson patent (337b-346b). This amendment was accompanied by an affidavit of Cyrus Klingsberg, another one of its research chemists (347b-349b). In the memorandum forming part of the amendment, Corning took the position that basalts do not contain titania (TiO_2) and therefore Watson did not disclose the same method of crystallization as Stookey's application; *i.e.*, crystallization on titania nuclei. The District Court was troubled by this representation (39a; 271b; footnote omitted):

> ". . . Nevertheless, one bothersome point remains and that is the representation by plaintiff's patent solicitor to the patent examiner that basalts do not contain TiO_2. Undoubtedly, this statement is false since all basalts contain some TiO_2. However, the evidence indicates that the statement was innocently made."

The trial court concluded that the statement was innocent because the same solicitor had recently filed another application conceding that basalts do in fact contain TiO_2. The court said (39a-40a; 271b-272b):

> ". . . It is impossible for this Court to conclude that an attorney, especially one familiar with patent application procedures, would have made such contradictory statements which were readily apparent and subject to the scrutiny of the same patent examiner, unless innocently made."

8. *Fourth Rejection: First Partial Allowance.* The foregoing amendments, affidavits and interviews finally caused the examiner to allow eleven claims on September 4, 1959, but he still rejected eight others as unpatentable over the prior art (350b-352b).

9. *Fifth Amendment:* On September 18, 1959, Corning once again amended (353b-356b) reasserting the Klingsberg affidavit and adding by way of additional support an affidavit of another of its research chemists, Herbert D. Kivlighn (357b-359b). Kivlighn, like Klingsberg, reported experimental results purportedly showing that Watson's method produced an entirely different product than Stookey's.

The Kivlighn affidavit also was attacked at trial on the ground it was misleading and helped to deceive the examiner as to the pertinency of the prior art. But the District Court stated, "The implication of the affidavit is what one wishes to draw" (37a; 269b). "The choice was left to the one attempting to follow it" (37a; 269b).

10. *Fifth Action: Second Partial Allowance:* Shortly after the September 16th Amendment, the examiner allowed nine more claims and held one more allowable subject to cancellation of another (360b-361b).

11. *Sixth Amendment:* Corning complied (362b), and the patent finally issued on January 12, 1960 with all claims limited to the presence of at least 50% crystals (281b-289b).

B. Indefiniteness of the Patent in Suit.

As has been indicated above, the District Court held the patent invalid for indefiniteness, in the light of the requirements of 35 U. S. C. § 112 (*supra,* p. 4), because at the time the patent issued, lengthy independent experimentation was required to devise a test to measure the percentage of crystallinity of the product.

The District Court noted, in language already quoted above, p. 5, that "Even though the Patent Office did not require the 50% limitation in the patent, the patentee included this limitation and relied upon it to distinguish his patent from the prior art. Consequently, the public is entitled to experiment in this glass ceramic area and related fields up to the 50% crystallinity without being compelled to independently experiment to determine the limits of the patent claims ". . . . A patentee cannot foist a great financial burden on another to develop a new measurement technique to determine whether he is infringing the patent" (44a-45a; 276b-277b).

In view of the ruling below on the point, it is necessary to set forth in full the District Court's findings that neither Corning nor Anchor had been able despite numerous expensive tests to determine percent crystallinity within a 7 to 10% range of error (45a-46a; 277b-278b; footnotes omitted):

> "The patent in suit states that the percent crystallinity could be determined by X-ray diffraction, the only test described. However, Corning at the time of its patent application, had not measured any of the various examples in its patent for percent crystallinity and Corning's witnesses admitted that it would take too long and be too difficult to measure the examples for percent crystallinity.

"In 1956 two weeks before the patent application, Corning's records show that it was impossible to determine percent crystallinity by X-ray diffraction. In 1958 Corning was still unable to determine percent crystallinity of a glass ceramic by either X-ray diffraction or electron microscopy, although it was possible to determine this percentage roughly by chemical analysis. Finally, by 1964, with the help of new techniques which were developed after a year of independent experimentation, Corning's experts were able to make an estimate of the crystallinity in the glass ceramics within a 4 to 5% range of error. A description of this new technique was first published in 1964, about eight years from the time of the patent application and four years after it was issued.

"Between the time the patent issued and the sale of its commercial products, Anchor spent a great deal of time and money trying to measure the percent crystallinity in its proposed commercial products. Anchor spent over $100,000 to determine the percent crystallinity; however, this includes the cost of an X-ray machine and the cost of training personnel to operate it. The training and equipment costs are irrelevant for a patentee does not have to pay the cost of teaching competitors to use measurement equipment or buy it. But, it cannot foist upon them the cost of developing a technique, which is not commonly known or available. Furthermore, Anchor had to obtain the help of four independent research sources to devise tests methods before being able to determine percent crystallinity within the 7 to 10% range of error. For this reason, the patent must be held invalid . . ."[4]

4. At the present time crystallinity measurements of glass-ceramics are notoriously inaccurate. Thus, chemical analysis, a technique never suggested in the literature (86b), permits only a "rough" determination, as found by the trial court (45a; 277b). And Corning's experts illustrated the inaccuracy of the two other available tech-

Accordingly, the District Court entered final judgment in favor of Anchor in respect of the invalidity of Corning's patent but dismissed Anchor's counterclaims based upon its allegations of fraud on the Patent Office (48a; 280b).

C. The Ruling Below.

As has been indicated, the court below reversed. Although it agreed that, "Juxtaposed against the narrow interpretation of the patentee's claims the result reached by the District Court was inevitable" (*infra*, p. A9), it held that since the Stookey patent was a "pioneer patent", the standards placed upon the patent by the District Court were, as a matter of law, "too strict" (*infra*, p. A6) and that the patent is entitled to a broader construction. Applying a broader construction it then found that ". . . the Stookey patent's sphere of protection will extend to 40% crystallinity" (*infra*, p. A10).

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niques, electron microscopy, and X-ray diffraction. With X-ray diffraction, one expert got 40% crystals while with the electron microscope another expert got 66% crystals for the *same* product (63b).

Each technique is plagued with error-producing factors. Thus, to measure crystallinity of each composition by X-ray diffraction requires "a great deal of luck and plenty of years of work" (137b-138b), while measurement by the electron miscroscope, a technique developed after the patent issued, depends upon the untested assumption that a small number of photomicrographs, each one showing an area one-hundred thousandth the size of a common pinhead are representative of the entire product (61b-63b; 66b-67b).

Because of these problems, none of the examples of Corning's patent had been measured for percent crystallinity at the time the patent issued (7b; 208b), none of the examples refer to the percent crystallinity of the products described, and even Corning's scientists (Stookey and Armistead) admitted such crystallinity measurements would have taken fifty years to make (207b, 117b). At no time during the prosecution of the patent application did Corning disclose these facts to the Patent Office.

REASONS FOR GRANTING THE WRIT.

Rarely does a decision wipe out at a single blow so many doctrines heretofore settled by this Court as the one now sought to be reviewed—or open up so wide a field for the profitable exercise of improper monopoly.

For here the court below permitted the patentee, Janus-like, to speak out of one mouth to persuade the Patent Office that a limitation was important and then to speak out of the other to convince the appellate court that it was not. Thus the decision jettisons completely the very heart of the doctrine of file wrapper estoppel. Moreover, the court below disregarded both facts and law in labeling the patent in suit a "pioneer", and then compounded that error by brushing aside the established rule that pioneer patents like all others must state their claims with definiteness—thus formulating a dual standard of definiteness under 35 U. S. C. § 112.

First: The most far reaching—and most dangerous—departure from hitherto settled patent doctrine appears in the utter disregard by the court below of the doctrine of file wrapper estoppel, the rule that limitations introduced to distinguish claims from the prior art cannot subsequently be disregarded or construed to recoup what was given up.

Very briefly, after Corning's application had been twice rejected as unpatentable over the prior art, it amended its claims to assert that the product was at least 50% crystalline, and it argued that this limitation distinguished its claims from the prior art cited by the examiner. See *Second Amendment, supra,* p. 8.

That was Corning's patent office position. In litigation, however, Corning changed its tune; the inventor testified as a witness in court that the 50% limitation was unimportant (*infra,* pp. A9-10). The District Court very properly held Corning to its earlier position, saying

(44a; 276b) that "Even though the Patent Office did not require the 50% limitation in the patent, the patentee included this limitation and relied upon it to distinguish his patent from the prior art."

For this it was criticized—and reversed—by the court below (*infra,* pp. A6-A13, A14), which held—"In our view the District Court erred in finding Corning's patent to be unenforceable, since the standards placed upon this particular patent were, as a matter of law, too strict" (p. A6). "In interpreting the claims and specifications the District Court relied too heavily on the 50% crystallinity standard set forth in the patent" (p. A9).

Disregarding the prosecution history of the patent, shutting its eyes to the indisputable fact that Corning had itself inserted that standard to show novelty in the face of multiple rejections based on the prior art, the court below relied instead on the inventor's self-serving testimony at trial that the 50% standard was unimportant (*supra,* p. 6).

Plainly, such reasoning places a profitable premium on shifts and turns by a patentee, on taking one position to get a patent allowed and then changing to a position precisely opposite when the patent is litigated. Equally plainly, the reasoning of the court below wipes out at one blow the settled doctrine of file wrapper estoppel, long insisted on by this Court, and only very recently reaffirmed, *Graham v. John Deere Company of Kansas City,* 383 U. S. 1, 33: "Claims as allowed must be read and interpreted with reference to rejected ones and to the state of the prior art; and *claims that have been narrowed in order to obtain the issuance of a patent by distinguishing the prior art cannot be sustained to cover that which was previously by limitation eliminated from the patent.*" [Italics added]

Second: The characterization of the patent in suit by the court below as a "pioneer patent" is a demonstrable misstatement of both fact and law: of fact because it

ignores completely the long and difficult course of the patent's prosecution history; of law because it nullifies this Court's standards on the nature of a "pioneer patent."

No one reading, much less studying, the opinion below would ever learn therefrom that the claims of the present Corning patent had been several times rejected as unpatentable over the prior art in a crowded field, or that those claims had evolved from six amendments supported by several affidavits of questionable accuracy before the patent issued, or that the road to allowance of the application required the timely intervention of the examiner's former superior, whom Corning recalled from retirement to serve as its "consultant" and in that capacity to argue with the examiner. It is for these reasons that we have set forth above the prosecution history of the present patent at some length (*supra,* pp. 7-11).

Nor does the patent in suit meet this Court's restrictive definition of a "pioneer patent." That expression has always been sparingly applied, as "covering the achievement of the desired result in its widest form, unlimited by specific details." *Gordon v. Warder,* 150 U. S. 47, 53-54, or as "covering a function never before performed, a wholly novel device, or one of such novelty and importance as to mark a distinct step in the progress of the art, as distinguished from a mere improvement or perfection of what had gone before." (*Boyden-Power Brake Co. v. Westinghouse,* 170 U. S. 537, 561-562).

The accolade of pioneer has been charily applied indeed, to the Howe sewing machine, to the Morse telegraph, to the Bell telephone (*ibid.,* at 562). Westinghouse's first air brake qualified (*ibid.*), so did Marconi's first radio transmitter; but later improvements on these devices did not. *Boyden-Power Brake Co. v. Westinghouse, supra; Marconi Wireless T. Co. of America v. United States,* 320 U. S. 1.

To accept the characterization of the present patent as a "pioneer" is to substitute sloganeering for facts, to ignore the mass of documentary proof in the record contra-

dicting that label and to brush aside this Court's strict standards.

Third: But even if for purposes of argument—and in disregard both of the present record and of prior decisions here—we accept the characterization of "pioneer" in this case, that concession still does not sustain the decision below. For it has long been plain that pioneer patents, like all others, are subject to the general principles governing—and limiting—all other patents. The public must be protected from uncertainty in patent claims, whether they be for pioneer inventions or otherwise.

Neither the possible commercial value of the invention nor the reputation of the inventor permit these principles to be relaxed. As said in the *Marconi* case (*supra,* at 37-38), "Marconi's reputation as the man who first achieved successful radio transmission * * * however well-deserved, does not entitle him to a patent for every later improvement which he claims in the radio field. Patent cases, like others, must be decided not by weighing the reputations of the litigants, but by careful study of the merits of their respective contentions and proofs."

Specifically, the standards of definiteness now codified in 35 U. S. C. § 112 (*supra,* p. 3) have been held equally applicable to basic, i.e., pioneer patents. "Patents, whether basic or for improvements, must comply accurately and precisely with the statutory requirement as to claims of invention or discovery." *General Electric Co. v. Wabash Appliance Corp.*, 304 U. S. 364, 369; *United Carbon Co. v. Binney & Smith Co.*, 317 U. S. 228, 232.

By reading a double standard of definiteness into the statute now in suit (assuming arguendo that the patent is of a pioneer character) the court below has nullified the command of 35 U. S. C. § 112 and the holdings of a long line of decisions here construing that statute. By the device of characterizing a patent as a "pioneer" it has replaced the certainty of the statute with a double standard never intended by Congress.

Although the court below concluded that the liberal interpretation which it accorded the patent claims met the

lower standard of definiteness required of a pioneer patent, in fact it simply shifted the 7-10% margin of error (which the District Court found to be inherent in 1960 crystallinity measurements) from the 50% level to the 40% level. But to come within this margin of error still required "costly and lengthy independent experimentation" to devise a measurement test. Corning's selection of such claim language is particularly inexcusable here as it could instead have relied upon physical and electrical properties capable of simple and economical determination (66a-67a; 8b-9b; 17b-24b).

The District Court recognized the 50% limitation for what it truly is—a phantom limitation—numerically definite, but unsusceptible of measrement by known tests and with the degree of precision required by 35 U. S. C. § 112. Indeed, such a limitation should be held indefinite *per se*. But instead, the court below reconciled it with the requirements of § 112, thereby placing its *imprimatur* on the use of phantom terms, and providing added incentive for the further proliferation of the already highly developed art of "opaque" drafting of patent claims recently criticized by this Court in *Brenner v. Manson*, 383 U. S. 519, 534, 538.[5]

Fourth: The decision below calls for review because of the immense importance of the patent in suit to the public generally and to the entire glass industry specifically. Before the decision of the District Court the public could at least experiment with products containing less than

5. The court below also said (*infra*, p. A11), "Examining the District Court's narrowly interpreted conclusion in a more favorable posture toward the patentee, it is clear that Anchor was not unduly burdened in establishing the bounds of the Corning patent" and then went on to differ with the District Court's findings (*supra*, p. 12), as to the difficulties in determining the degree of crystallinity claimed in the patent. In the event that certiorari is granted, we shall also demonstrate that the District Court's findings in regard to the tests required to measure crystallinity were amply supported by the evidence, and that the treatment of those findings by the court below (*infra*, pp. A11-12) violated the plain terms of Rule 52(a) F. R. Civ. P. (*supra*, p. 3), and laid down a rule of law which is contrary to this Court's decisions.

50% crystals. The problem, which the District Court recognized, was determining how to devise a test for measuring what fell within that range. The court below, however, further extended the reach of the patent's monopoly to both crystalline and semi-crystalline products comprised of at least 40% crystals (*infra,* A10). Where the boundaries of the patent monopoly will eventually be drawn is uncertain, and thus it is doubtful whether anyone will have sufficient temerity to venture into this important field in the face of its aggressive domination by Corning and the consequent threat of litigation. Thus, as a practical matter, virtually all experimentation by competitors in this field will be foreclosed for at least a decade.

As the record shows, Corning's annual sales of products covered by the patent have exceeded one hundred million dollars (80-81a; 82a). Furthermore the growth potential of this market is unlimited (68-71a; 303-306a).

In fact, so extensively did Corning dwell on the versatility and commercial potential of these products that the two lower courts were mesmerized into believing that the patent represented a wholly unique and unprecedented break-through in glass technology—despite its precarious history in the Patent Office (*supra,* pp. 7-11). Actually, the patent is one of a series of patents which Corning has obtained for similar developments. All relate to products with improved physical features obtained by a controlled two-step crystallization process. Armistead (401-404b) and Blau (395-400b) were first in the series; then came Stookey's FOTOFORM invention discussed by the court below (*infra,* p. A7); next came the patent in suit. Since its issuance, several other related patents have been granted to Corning including the two relating to the formulation and heat treatment of CORNING WARE (*supra,* p. 4).

Anchor is the only competitor marketing an allegedly infringing product. Thus, if the decision below is allowed to stand, Corning will, as a practical matter, have an unchallenged and unprecedented monopoly over this vast field of glass-ceramic products.

CONCLUSION.

The decision sought to be reviewed utterly ignores several fundamental legal principles long applied by this Court in its efforts to prevent patents from becoming devices to exclude the public from vast areas of tremendous technical significance. This petition for a writ of certiorari should therefore be granted.

Respectfully submitted,

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June 1967.

APPENDIX A.

OPINION BELOW.

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

Nos. 15923 and 15924

CORNING GLASS WORKS,
Appellant in No. 15923,

v.

ANCHOR HOCKING GLASS CORPORATION,
Appellant in No. 15924,

APPEAL AND CROSS-APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE

Argued October 20, 1966

Before MARIS, MCLAUGHLIN and KALODNER, *Circuit Judges.*

OPINION OF THE COURT

(Filed March 20, 1967)

By MCLAUGHLIN, *Circuit Judge.*

On November 8, 1963, plaintiff, Corning Glass Works, filed a complaint charging defendant, Anchor Hocking Glass Corporation, with infringement of both product and process claims of its Stookey patent.[1] In answer, defendant denied the infringement charge and further asserted that plaintiff's patent was invalid because; 1) of indefiniteness, 2) the method claims covered inoperative species, and 3) the

1. Patent No. 2,920,971. Application for the patent was made on June 4, 1956 and the patent issued on January 12, 1960.

claims were not patentable over the prior art. Defendant also charged unenforceability by reason of fraud on the Patent Office and included a declaratory judgment counterclaim. On April 26, 1965 defendant amended its answer and counterclaim. The amended answer was directed at a charge of misuse in connection with plaintiff's alleged unlawful fair trading of its product "Corning Ware".[2] The additional two counts to the counterclaim alleged an antitrust violation and unfair competition with both these charges resting on the contention that plaintiff obtained its patent by intentional fraudulent misrepresentation.

The case was brought to trial in the United States District Court for the District of Delaware before Chief Judge Caleb M. Wright. As set out by the District Court, the issues to be decided were; the validity of the patent, the allegations of fraud and the question of infringement. Counts two and three of defendant's amended counterclaim were dismissed by the court's final judgment of March 29, 1966 and the charge of misuse contained in the amended answer was deferred to a future time.

In his opinion, Corning Glass Works v. Anchor Hocking Glass Corp., 253 F. Supp. 461 (D. Del. 1966), Judge Wright found in favor of the plaintiff on the question of fraud and further that the doctrine of unclean hands was not applicable to the facts in the case. On the allegations of invalidity, the court found that plaintiff's invention was patentable over the prior art and that defendant "failed to make even a prima facie showing of inoperativeness", i.e. that the claims of the patent were too broad. In dealing with defendant's charge that the patent was invalid on the ground that its claims were indefinite and vague, the court was satisfied that the claim language was definite. However, the court found that the patent was unenforceable "* * * because in 1956, when the application was made, and in 1960, when the patent issued, to determine the

2. Trade name given the plaintiff's line of domestic cookware covered by the patent in suit.

percent crystallinity within this 7 to 10% margin of error required costly and lengthy independent experimentation to devise a test to ascertain whether a product was within the bounds of the patent claims." 253 F. Supp. 461 at 479.

The Stookey Patent

The patent in suit was the development of Dr. Stanley Donald Stookey, the present Director of Fundamental Chemical Research at the Corning Glass Works. Dr. Stookey's patent teaches the devitrification or crystallization of glass into a glass ceramic material called Pyroceram. Starting with a glass the process initiates a change so that the end product no longer has the properties of glass but rather crystalline properties.

Glass by its nature is a super cooled liquid which at a high temperature has an amorphous molecular structure unlike the ordered structure of a crystalline material. As the glass is cooled it becomes viscous until it reaches its final rigidity where it has the same molecular structure it possessed as a liquid. A pure transparent glass will not contain any crystals because its molecular structure is not receptive to crystallization. However, if at some point prior to or during the cooling phase small particles or imperfections are introduced, crystallization will occur. These microscopic particles are called nuclei and these nuclei initiate the growth of crystals.

In the manufacturing process of glass, nucleation is synonymous with imperfection, because the area that is crystallized has different properties than the rest of the glass which will weaken the glass to the breaking point or cause undesired opaqueness. Through the discovery of Dr. Stookey, however, the nuclei are artifically introduced so that their production and number are controlled independently of the crystallization of the main body of glass. In the words of Dr. Stookey, "[t]he effect of producing these billions of nuclei throughout the body, the nuclei being

such small particles that they can't be seen except perhaps by the electron miscroscope—they are too small to see with the ordinary optical microscope—but each one of those billions has a similar effect herein producing eventually after heat treatment an individual crystal, and the difference there is that without very much heat treatment each of these crystals grows until it comes into contact with the other crystals growing along with it until finally the material is all crystalline, or essentially all crystalline."

Corning's patent teaches that glass can be converted to a predominately crystalline or semicrystalline ceramic body having "* * * at least 50% by weight * * * of crystallizable glassmaking ingredients, * * *."[3] To identify and determine the quantity of crystals the patent suggests the use of a "* * * conventional X-ray powder spectrometer or diffractometer, equipped with a Geiger counter and a curve—or trace—drawing device, * * *."[4] It was precisely the percent crystallinity and the method measuring that percentage that became the focal point of the District Court's determination to invalidate plaintiff's patent.

The Stookey patent was charged by the defendant to be invalid for vagueness since independent experimentation was required to determine; 1) whether a given glass formula will make a pyroceram, 2) the size of the resulting crystals and whether they interlock and 3) percent crystallinity. Before passing upon defendant's assertions, however, the court deemed it necessary to deal with the preliminary issue of whether the 50% crystallinity criterion was definite within the meaning of 35 U. S. C. A. 112.

Finding that the claim language (50% crystallinity) was definite the District Judge turned to consider whether the limits of the patent were indefinite by the standards of 35 U. S. C. A. 112. The problem of construing the patent's limitations was further complicated by the existence of a 7 to 10% margin of error in measuring percent crystallinity

3. Patent No. 2,920,971, claim #1.
4. Patent No. 2,920,971.

by X-ray diffraction.[5] Thus, the court's basic question was rephrased to discover "whether this 7 to 10% margin of error in determining percent crystallinity is so great as to make the patent claims indefinite with 35 U. S. C. A. 112." 253 F. Supp. 461 at 478.

The court set forth three standards upon which the doctrine of indefiniteness rests; 1) protection of the patentee, 2) the encouragement of the inventive genius of others and 3) the assurance that the subject of the patent will be dedicated ultimately to the public.[6] In light of these standards the court was satisfied that the margin of error was not so large as to be indefinite. The court concluded that where a margin of error does exist in a measuring technique the court should interpret the claims "* * * as narrowly as possible when considering the patentee's protection, * * * and interpreting them broadly when considering the public dedication * * *." 253 F. Supp. 461 at 479. By way of illustration the court pointed out that "* * * if a competitor produced a product which on measurement by X-ray diffraction showed 59% crystallinity, it would be entitled to a judgment of noninfringement because within the limits of measurement preciseness of 10% error it is possible that the competitor's product is only 49% crystalline; consequently it falls outside the claim limits of the patent. Thus the patentee is protected although his protection may be more limited than he desires." 253 F. Supp. 461 at 478, 479.

Even though the claims were found to be definite under 35 U. S. C. A. 112 the District Court declared the patent

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5. There was a dispute between the parties as to whether the court should determine the standards and tests at the time the patent application was made or from the date the patent issued. The court, however, found it unnecessary to resolve the problem because the same 7 to 10% margin of error existed at the time of application and the time of issue.

6. These three standards were established by the Supreme Court in the case of General Electric Co. v. Wabash Appliance Corp., 304 U. S. 364, 369, 58 S. Ct. 899, 82 L. Ed. 1402 (1938).

unenforceable "* * * because in 1956, when the application was made, and in 1960, when the patent issued, to determine the percent crystallinity within this 7 to 10% margin of error required costly and lengthy independent experimentation to devise a test to ascertain whether a product was within the bounds of the patent claims." 253 F. Supp. 461 at 479. In support of its ruling the District Court relies on the Third Circuit case of Standard Oil Co. v. Tide Water Associated Oil Co., 154 F. 2d 579 (3 Cir. 1946), which held at p. 583 that "* * * no inventor may compel independent experimentation by others to ascertain the bounds of his claims." This language was framed by the District Court to encompass the exigencies of the present situation, i.e. that "[a] patentee cannot foist a great financial burden on another to develop a new measurement technique to determine whether he is infringing the patent." 253 F. Supp. 461 at 479. In the opinion of the court Anchor's efforts to determine percent crystallinity within a 7 to 10% range of error involved such an expenditure of funds, with both their own experimentation and in their consultation with others, as to constitute a "great financial burden" and thus render Corning's patent unenforceable.

Measurement of Percent Crystallinity

In our view the District Court erred in finding Corning's patent to be unenforceable, since the standards placed upon this particular patent were, as a matter of law, too strict.

The District Court held that the Corning patent is "* * * a basic and pioneering advance in glass and ceramic technology." 253 F. Supp. 461 at 465. I believe that Dr. Stookey's discovery is, in every sense of the word, a "pioneer"—"* * * a patent covering a function never before performed, a wholly novel device, or one of such novelty and importance as to mark a distinct step in the progress of the art, as distinguished from a mere improve-

ment or perfection of what had gone before." Westinghouse v. Boyden Power Brake Co., 170 U. S. 537 at 561, 562, 18 S. Ct. 707, 42 L. Ed. 1136 (1898). Where the court is confronted with such a pioneer patent liberality becomes the keynote of construction requiring the court to give the patentee a wide breadth of protection in construing the patent claims and specifications, Sessions v. Romadka, 145 U. S. 29, 12 S. Ct. 799, 36 L. Ed. 609 (1892); Consolidated Window G. Co. v. Window G. Mach. Co., 261 F. 362 (3 Cir. 1919), cert. den. 251 U. S. 558, 40 S. Ct. 179, 64 L. Ed. 413 (1920); Etten v. Kauffman, 121 F. 2d 137 (3 Cir. 1941).

Until the development of Pyroceram by Dr. Stookey crystallized glass accounted for only a fraction of the total world glass production.[7] Glasses that were intentionally crystallized were opal (light-diffusing) glasses which contained at most 10% crystallinity. The only crystallized composition which approached the 50% requirement was a process invented by Dr. Stookey himself called Fotoform. The crystallinity of this process ranges somewhere between 24 and 35 percent. The success of Pyroceram ushered in a new era in the field of crystallized glass and glass ceramics. Dr. Stookey's discovery was found to possess properties which set it apart from any prior development in the art. Pyroceram's thermal, abrasive and dielectric features made it particularly adaptable to a wide variety of commercial applications—from cooking ware to guided missiles and deep sea diving vessels.

Section 112, 35 U. S. C. A. is designed to protect the patentee and encourage experimentation in the area not covered by the patent. The courts are required to reconcile these conflicting concepts but as this court pointed out in Jones Knitting Corporation v. Morgan, 361 F. 2d 451, 454 (3 Cir. 1966), "* * * each case presents a different question, and the rule is not a technical one, but one made to

7. Dr. Stookey testified that "* * * about 99 per cent of all glass that is made in the world is completely transparent and free of crystals."

protect the public." With this in mind it should be noted that the law provides guidelines to aid the court in balancing these concepts. Where the art is crowded the claims must be certain and definite enough to distinguish the patent from prior discoveries, Barkeij v. Lockheed Aircraft Corp., 210 F. 2d 1 (9 Cir. 1954). Where the patent is a pioneer in the art the necessity to distinguish previous inventions is not as demanding, but a sufficiently precise description is still required to "* * * clearly circumscribe what is foreclosed from future enterprise." United Carbon Co. v. Binney Co., 317 U. S. 228, 236, 63 S. Ct. 165, 87 L. Ed. 232 (1942).

The important problem before us is whether Corning's patent lacked such precision in description as to compel "* * * costly and lengthy independent experimentation to devise a test to ascertain whether a product was within the bounds of the patent claims." 253 F. Supp. 461 at 479. To phrase the question more precisely under the corollary test of the District Court, the patent's invalidity rises and falls with the evaluation of whether Corning foisted a great financial burden upon Anchor "* * * to develop a new measurement technique to determine whether he [Anchor] is infringing the patent." 253 Supp. 461 at 479. For the reasons that follow we believe the question must be answered in the negative.

The Corning patent teaches that its process results in a composition which contains 50% crystallinity by weight. In order to measure the weight percentage crystallinity the patent refers to the use of the X-ray diffraction method. The District Court indicated that Corning, in 1956 and in 1958, was unable to measure the percent crystallinity within the 7 to 10% range of error by X-ray diffraction. It was not until 1964, after a year of independent experimentation, that plaintiff refined its X-ray diffraction technique down to a 4 to 5% margin of error. Because of the uncertainty of the X-ray diffraction method defendant was forced to spend time and money in the development of its own

testing methods and this in the opinion of the District Court invalidates the patent. Juxtaposed against the narrow interpretation of the patentee's claims the result reached by the District Judge was inevitable. Once, however, the District Court's cloak of strictness has been removed, and the broad construction due this pioneer patent is applied, it becomes evident that Anchor was not under any burden in determining whether or not it was infringing plaintiff's patent.

In interpreting the claims and specifications the District Court relied too heavily on the 50% crystallinity standard set forth in the patent. In his own words Dr. Stookey stated that the process he invented was designed to convert glass "* * * to something that has not the properties of glass basically but the properties of crystals." The first paragraph of the patent explains that the process is concerned with changing preformed glass articles "* * * to predominantly crystalline or semicrystalline ceramic bodies * * *." It is quite apparent that the designation of 50% crystallinity was an effort to describe the conversion of a glass to a predominantly crystalline body and not an arbitrary point at which the patentee wished to assert a monopoly. On cross-examination Dr. Stookey clearly stated the purpose of his invention:

> "To my mind and certainly the original purpose of the invention whether it is 40 or 45 or 50 or 55 per cent is not critical. The purpose of the invention is to change a glass to a material with substantially different properties, predominantly crystalline, and for that reason I don't consider that any one particular percentage makes any sharp dividing line.
>
> * * *
>
> "There is this gray area in which any of the properties may be changing, but it is not possible to set one particular percentage, like 49 per cent, as the dividing line between a crystal and a glass. But all of

the glasses that have been known to me from the past have been glass with perhaps a maximum of 10 to 15 per cent of crystals.

"I mentioned my own invention of FOTOFORM in which after heating to the etching stage, there was about 24 per cent to 35 per cent crystals. This is the only example of a glass that I know of that had that much crystallinity. So I am distinguishing between the two ends of the scale really and doing my best in the patent to describe this."

The District Court noted that "[t]he change in properties begins at approximately 40% crystallinity and in most cases is complete at 60%. 253 F. Supp. 461 at 479. Since a patentee is under no obligation to claim the limits of his invention that portion of plaintiff's patent between 40 and 50% crystallinity was considered by the court to be dedicated to the public. However, the testimony of Dr. Stookey demonstrated that no such public surrender was intended by Corning. The law is settled that a patent should not be struck down or its claims unnecessarily limited where a reasonable construction of the specifications and claims will protect the invention, 4 Deller's Walker on Patents, Sec. 242, p. 118 (2d ed. 1965). If such a construction is applied in this case the Stookey patent's sphere of protection will extend to 40% crystallinity. Nor would giving the plaintiff a patent monopoly in the area of 40% crystallinity violate the provisions of 35 U. S. C. A. 112 because as previously stated, the 50% crystallinity standard must be read in the light of the patent's overall purpose, which is to convert preformed glass articles to predominantly crystalline or semicrystalline ceramic bodies. In dealing with Section 112 the Second Circuit stated in Georgia-Pacific Corp. v. United States Plywood Corp., 258 F. 2d 124 (2 Cir. 1958), cert. den., 358 U. S. 884, 79 S. Ct. 124, 3 L. Ed. 2d 112 (1958):

"On the other hand, patentable inventions cannot always be described in terms of exact measurements, symbols and formulae, and the applicant necessarily must use the meager tools provided by language, tools which admittedly lack exactitude and precision. If the claims, read in the light of the specifications, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the courts can demand no more." 258 F. 2d 124 at 136.

Examining the District Court's narrowly interpreted conclusion in a more favorable posture toward the patentee it is clear that Anchor was not unduly burdened in establishing the bounds of the Corning patent. The opinion of the District Judge explained that in 1958 Corning was unable to determine percent crystallinity by X-ray diffraction or electron microscopy, although, the court conceded, "* * * it was possible to determine this percentage roughly by chemical analysis." 253 F. Supp. 461 at 480. The chemical analysis test, though not set forth in plaintiff's patent as a means of measuring percent crystallinity, was, nevertheless, a common and inexpensive method available to Anchor to determine the limits of the Stookey patent. Quantitative measurement by chemical analysis is a first principle of any scientific investigation and its employment, if not explicit, would certainly be implied. Further, the X-ray diffraction test was by no means lacking as a method of calculating the patent claims. The testimony of Anchor's own witness, Dr. Rustin Roy, showed that in 1956 percent crystallinity could be determined with considerable accuracy. The testimony read:

"Q. Do you think, Dr. Roy, that you personally would have been unable to determine the weight percentage of spodumene crystals in one of these products in 1956 so that your results were no more accurate than plus or minus 10 per cent using the best techniques and

intelligence, and so on, that you had? A. I would give myself about 8 per cent maybe.

Q. You think you might do just a little bit better? A. Just a little."

The evidence indicates that defendant could adequately measure the patent claims and that the "great financial burden" was not foisted upon but rather assumed by Anchor in an effort to distinguish or break the Stookey patent—not to determine its limits. In a letter of March 21, 1960 to Dr. W. A. Weyl of Pennsylvania State College, Paul D. Dilliard, the Technical Director of Practical Research at Anchor, acknowledged that defendant's developments would infringe on Corning's patent rights [8] and Dr. Dilliard testified to this fact in his deposition.[9]

From the facts and circumstances concerning this invention and under the sound law of the case the only reasonable conclusion is that the patent was sufficiently described so that those who are skilled in the art were apprised of the patent claims and specifications without being forced to engage in costly independent experimentation.

We have examined at length the contentions of the appellee cross-appellant concerning other alleged sources of indefiniteness in the Stookey patent not specifically dealt

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8. The pertinent part of the letter reads: "As you will note from this patent the process is such that our own developments would infringe on the patent rights. It is our present understanding from our patent attorney that if it can be shown that either all or part of the claims in this patent have been known or practiced prior to the patent application, there is a possibility of breaking the patent. It is also our understanding that the major key or claim in this patent is the fact that the resulting product is 50% or more crystal. It is these two points which we need to resolve before decisions can be made as to the present standing of our development."

9. "Q. Now, the letter you wrote Dr. Weyl goes on to state, 'As you will note from this patent the process is such that our own developments would infringe on the patent rights.' Were they referring to the Stookey patent here in suit? A. That is right, yes.

Q. And was that your understanding of the situation at that time? A. That is correct."

with in the opinion below, alleged fraud on the Patent Office by appellant and alleged invalidity of the Stookey patent over the prior art. We find all of these to be without merit. It remains to be said that the patent here found valid is a great basic invention which has brought substantial benefit to the public at large.

The judgment of the District Court dismissing the complaint and granting the declaratory judgment sought by Count 1 of the defendant's counterclaim and declaring invalid each and every claim of U. S. Patent No. 2,290,971 will be reversed and this cause will be remanded to the District Court with direction to enter judgment in favor of plaintiff-appellant. The dismissal by the District Court of Counts 2 and 3 of defendant's counterclaim will be affirmed. The question of infringement by defendant of plaintiff's patent which quite properly under the trial decisional circumstances was not passed upon by the District Court, will be remanded to that Court for its consideration.

APPENDIX B.

JUDGMENT BELOW.

[Caption omitted.]

Present: MARIS, MCLAUGHLIN and KALODNER, *Circuit Judges.*

JUDGMENT.

This cause came on to be heard on the record from the United States District Court for the District of Delaware and was argued by counsel.

On consideration whereof, it is now here ordered and adjudged by this Court that those parts of the judgment of the District Court, filed March 29, 1966, dismissing the complaint and granting the declaratory judgment sought by Count 1 of the defendant's counterclaim and declaring invalid each and every claim of U. S. Patent No. 2,290,971 be and the same are hereby reversed and the cause remanded to the District Court with direction to enter judgment in favor of plaintiff-appellant; that part of the judgment of the District Court, filed March 29, 1966, which dismissed Counts 2 and 3 of defendant's counterclaim be, and the same is hereby affirmed; the question of infringement by defendant of plaintiff's patent which quite properly under the trial decisional circumstances was not passed upon by the District Court be, and the same is hereby remanded to the District Court for its consideration. Costs taxed in favor of plaintiff.

ATTEST:

THOMAS F. QUINN

Clerk.

March 20, 1967.

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IN THE

Supreme Court of the United States

October Term, 1967

No. 249

ANCHOR HOCKING GLASS CORPORATION,
Petitioner,

v.

CORNING GLASS WORKS,
Respondent.

RESPONDENT'S BRIEF IN OPPOSITION TO PETITION FOR WRIT OF CERTIORARI

There are no special or important reasons why the writ prayed for should be granted.

There is no conflict between decisions of Courts of Appeals, nor is there any important question of federal law which has not been, but should be, settled by this Court. There is nothing about this conventional suit for patent infringement which warrants review by this Court. The decision of the Court of Appeals for the Third Circuit, holding respondent's patent valid and enforceable, is manifestly right.

Opinions Below

The opinion of the Court of Appeals is reported at 374 F. 2d 473.

The opinion of the District Court is reported at 253 F. Supp. 461.*

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* The opinion of the Court of Appeals appears in Appendix A to the petition. The opinion of the District Court was not reproduced therein and, therefore, is reproduced as Appendix B to this brief for the convenience of this Court. The letters A or B followed by a number refer, respectively, to pages of these appendices.

Jurisdiction

Jurisdictional requisites are set forth in the petition.

Questions Presented

Questions 1, 2 and 4 do not present questions of law but rather are based upon inaccurate, argumentative, factual assertions unsupported by the record or the opinions of the Courts below.

Question 1 assumes a file wrapper estoppel which did not, in fact, exist, as shown by the decisions of the District Court and the Court of Appeals. The issue of infringement was not decided by the Courts below (A 13).

Question 2 is argumentative and wholly unsupported by the record or by the decisions of the Courts below in its reference to "affidavits of questionable accuracy" and "personal intervention of a retired former immediate superior of the examiner" (A 12-13; B 16-29).

Question 4 incorrectly states the holdings of both the District Court and the Court of Appeals.

Petitioner's question 3 purports to state a question of law but, in doing so, misinterprets the Court of Appeals decision. Both Courts below properly held that the claims' requirement of "at least 50%" of crystals was exact and definite and satisfied 35 U. S. C. § 112 judged by any standard. The Court of Appeals opinion, in addition, properly held that as a pioneer patent it should be accorded a liberality of construction. This phase of the Court of Appeals opinion follows what has long been the law of this Court as set forth in *Sessions* v. *Romadka*, 145 U. S. 29 (1892); *Eibel Co.* v. *Paper Co.*, 261 U. S. 45, 63 (1922); and *Smith* v. *Snow*, 294 U. S. 1, 14 (1934).

Statement of the Case.

The Stookey patent in suit (275a-283a) relates to ceramic materials produced by the controlled crystallization of glass. The District Court correctly found that "the

invention disclosed in the patent is a basic and pioneering advance in glass and ceramic technology." (B 5). The Court of Appeals agreed (A 6-7, A 13). The evidence amply supports this unanimous finding of the Courts below.

One of the patented products (patent example 15) was selected by engineers of the Applied Physics Laboratory at Johns Hopkins as the best available engineering material for making radomes (nose cones) for Navy guided missiles. The government in 1956 considered this radome use as a technical breakthrough (62a-63a, 285a-299a). No better material for these radomes has yet been found (63a).

This same patented product (called a glass-ceramic) was selected by a group of scientists at Penn State University as the best available material for making a new deep-sea diving vessel (the Benthos) for the United States Navy (68a-71a, 303a-306a). The Benthos is to be lowered into the deepest part of the ocean where it will be subjected to tremendous compressive forces.

The largest commercial use of Dr. Stookey's new glass-ceramics has been cooking and serving dishes sold under respondent's trademark CORNING WARE. This produet was first marketed in the Fall of 1958, and in 1960 respondent built a new plant for its manufacture having an annual capacity of about $40,000,000 worth (80a-81a). During the next four years, the plant had to be expanded twice (80a-81a).

Contrary to the statement in the petition (p. 14), the CORNING WARE formulation was developed by Stookey (617a-618a); it is very similar to and a refinement of patent Example 1 (615a-616a); and was found by the District Court to be covered by the patent in suit (B 13).

The awards received by Dr. Stookey for the invention in this patent include the Ross Coffin Purdy Award for the most valuable contribution to ceramic technical literature during 1958 (50a), the Toledo Award in 1964 from the Ohio section of the American Ceramic Society (51a), and the

John Price Wetherill Medal in 1962 by the Franklin Institute of Philadelphia (309a-314a, 112a-120a).

Professor Weyl of Penn State University, a long-time consultant of petitioner (246a), paid tribute to Stookey's invention in an article published in 1961 (569a-570a), saying:

> "Today, titania receives world wide attention because of Stookey's discovery[31] that TiO_2 can act as a catalyst for the formation of desirable crystalline phases which produce a ceramic material of high mechanical strength and low thermal expansion: pyroceram."
> [Reference 31 is to the Stookey patent in suit.]

Dr. Stookey has been acknowledged even by a group of Russian scientists as the originator of glass-ceramic materials (406a).

The prior art relied upon by petitioner was considered in the Patent Office and, as both Courts below agreed, does not begin to suggest Stookey's invention (A 6-7, A 13; B 5-13). Significantly, the petition avoids discussion of the prior art in any detail.

As originally filed, Stookey's application specified products containing 50 weight percent or more of crystals (278b, col. 13, ll. 64-69) and outlined an X-ray method of determining crystalline content of these products (287b, col. 13, ll. 29-57). Product claim 21 of the patent (289b) was relied upon in suit. This claim specifies a ceramic body made up of interlocked, inorganic crystals dispersed in a glassy matrix, specifies the crystal size as on the order of 0.1-20 microns in diameter, the amount of the crystals as "at least 50% of said body", states they are "formed by crystallization *in situ*", and then specifies the chemical composition of the original glass in which the crystals are formed. The method claims relied upon (1, 3, 5) define the initial glass-making composition that is melted and the two-stage heat treatment which is applied to this glass composition to produce the glass-ceramic product containing "at least 50%" of crystals.

Petitioner nowhere explains wherein the concrete claim limitation "at least 50%" of crystals was, or is, required to distinguish from the prior art. A similar limitation was used in original application claims 13 and 14 (292b) where the ceramic body was defined, *inter alia*, as made up of "a minor proportion" of a glassy matrix and "a major proportion" of crystals. This was simply one of several parameters used to define Stookey's new products.

Consistent with the District Court opinion, the Court of Appeals found (A 7) that the closest prior art was Dr. Stookey's own FOTOFORM products containing only 24-35% of crystals. Also, the District Court found (B 33) and the Court of Appeals agreed (A 9-10) that the unique properties of the patented products were not developed until the crystallinity reached the area of 40-60% of crystals.

The Courts below did not decide the issue of infringement. As to the crystallinity of petitioner's accused products, petitioner offered no evidence at the trial. Respondent's proofs showed these accused products contained over 70% crystals of all types (353a-356a, 125a).

The District Court held (B 30-32) that the language of the claims in the patent was an exact description and definite, satisfying the requirments of 35 U. S. C. § 112, as discussed by this Court in *General Electric Co.* v. *Wabash Appliance Corp.* 304 U. S. 364 (1938) and in *United Carbon Co.* v. *Binney & Smith Co.*, 317 U. S. 228 (1942). The Court of Appeals agreed (A 4-5).

The District Court held the patent in suit invalid for the sole reason that (B 33)

> "in 1960, when the patent issued, to determine the percent crystallinity within this 7 to 10% margin of error required costly and lengthy independent experimentation to devise a test to ascertain whether a product was within the bounds of the patent claims."

This holding was based on one sentence taken out of context from the decision of the Court of Appeals for the

Third Circuit in *Standard Oil Co. of California* v. *Tidewater Associated Oil Co.*, 154 F. 2d 579, 582-3 (3 Cir. 1946) (B 33).

The Court of Appeals on this point, held (A 12):

> "The evidence indicates that defendant could adequately measure the patent claims and that the 'great financial burden' was not foisted upon but rather assumed by Anchor [petitioner] in an effort to distinguish or break the Stookey patent—not to determine its limits."

This holding of the Court of Appeals was well supported by the evidence, including the following.

Petitioner purchased its first X-ray machine shortly after the patent issued (218a). One of its chemists, inexperienced in X-ray, was assigned to work with the machine (217a-218a, 246a-247a). Within a week or two, he was making quantitative measurements of crystallinity by the X-ray method (496a), and a week or two later had worked out a "Standard Method" (497a-501a). He continued to use this "Standard Method" for the next several months (502a-506a, 538a-543a, 593a-602a). By the end of the year, petitioner's chief chemist consulted experts on the X-ray method at Mellon Institute and was told that the X-ray method "can be expected to produce results with an error of 5% or less" (523a). In 1962, petitioner's chief chemist summarized his findings on the accuracy of the X-ray method in a report which stated, "The claims for the accuracy of the method range from $\pm$ 2% to $\pm$ 10%" (552a).

Respondent's scientists made crystallinity measurements not only by the X-ray method, but also by an electron microscope method starting in 1958 (409a, 133a-181a, 439a-489a). A third method, the age-old method of chemical analysis, was also used (356a-365a) in which the glassy parts are dissolved and the remaining crystals weighed to determine the percent of crystals in the body. The Court of Appeals found this latter to be "a common and inexpensive method available to Anchor to determine the limits of the Stookey patent" (A 11).

The record thus amply supports the conclusion of the Court of Appeals (A 12):

> "From the facts and circumstances concerning this invention and under the sound law of the case the only reasonable conclusion is that the patent was sufficiently described so that those who are skilled in the art were apprised of the patent claims and specifications without being forced to engage in costly independent experimentation."

Reasons for Denying the Writ

Petitioner first asserts that the decision below "jettisons" and disregards "the doctrine of file wrapper estoppel". Neither the District Court nor the Court of Appeals found any file wrapper estoppel in this case. No estoppel is spelled out by the history of the prosecution of the patent in suit, nor required by the prior art. The very premise of petitioner's first argument is, therefore, factually incorrect. Petitioner's own patent counsel, Mr. Wood, advised his client in 1961: "there was no file wrapper estoppel" (762a).

Petitioner next argues that Stookey's was not a pioneer patent. Both Courts below emphatically disagreed with this argument, and their conclusions are fully supported by the record.

Petitioner's third point is that the Court below applied a double standard of definiteness. Here, petitioner confuses the issue of definiteness with the question of liberality of construction. There can be no doubt that a pioneer patent is entitled to liberal construction. On the question of definiteness, both of the Courts below agreed that the claim language was definite. Indeed, no more exact language could be used in such claims than to require "at least 50%" of crystals. The Court of Appeals simply held that the District Court was wrong in finding that the percent of crystals in such products could not be measured with reasonable accuracy at the time the patent issued.

Petitioner's fourth point urges review of the case because of its "immense importance". Petitioner has not shown wherein the public has suffered, and the Court of Appeals answered this argument by stating (A 13)

> "... that the patent here found valid is a great basic invention which has brought substantial benefit to the public at large."

Neither has petitioner shown where this patent is of vital importance to the glass industry generally. Petitioner admits (p. 19) that it "is the only competitor marketing an allegedly infringing product." Petitioner does not add what the record shows, i.e., that the infringing product is a cheaply made copy of the patented product, and that petitioner from the outset deliberately embarked on its infringement program hoping to capitalize on a new business after it had been pioneered, developed and established by respondent.

CONCLUSION

The petition should be denied.

Respectfully submitted,

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APPENDIX B

District Court Opinion

Filed March 22, 1966

WRIGHT, CHIEF JUDGE.

This is a patent infringement action arising out of a single patent No. 2,920,971 (Stookey Patent) issued to plaintiff on January 12, 1960 upon an application of Stanley D. Stookey filed June 4, 1956. Plaintiff has been the sole owner of said patent since its issuance. The Court has jurisdiction and venue of the original action, based upon 28 U. S. C. A. § 1338a and § 1400b.

Plaintiff, Corning Glass Works (Corning), a New York corporation, with its principal place of business in Corning, New York, filed a complaint on November 8, 1963 charging that its Stookey patent had been infringed by the defendant, Anchor Hocking Glass Corporation (Anchor), a Delaware corporation with its principal place of business in Lancaster, Ohio. The complaint seeks a judgment that plaintiff's patent in suit is valid and has been infringed, that defendant be enjoined from further infringement, that an accounting be held to determine the damages and the plaintiff be awarded treble damages and its attorney fees and expenses, in addition to the costs of this action.

On December 30, 1963, Anchor answered denying infringement and alleged the patent in suit to be invalid: (a) because its claims are vague and indefinite, (b) because its method claims 1 to 11 are broader than the invention and cover inoperative species, and (c) because its claims are not patentable distinct from the prior art.

Defendant also charged that the plaintiff's patent was unenforceable because the patent was obtained by fraud on the Patent Office. With the answer, defendant filed a counterclaim for a declaratory judgment, raising the same issues as raised by the answer.

On April 26, 1965, defendant amended its answer and counterclaim. The amendment to the answer alleged that plaintiff's patent was unenforceable for misuse arising out of plaintiff's alleged unlawful fixing of resale prices in connection with plaintiff's fair trading of "Corning Ware."[1]

Plaintiff asserts that the allegations based on plaintiff's merchandising of "Corning Ware," even if proved, do not constitute a misuse of plaintiff's patent. Trial of this issue has been deferred to a future time.

The amendment to the counterclaim also added counts 2 and 3 asking for damages and injunctive relief. Count 2 alleged violation by plaintiff of § 2 of the Sherman Act[2] founded upon the allegation that plaintiff had obtained the patent in suit from the Patent Office by fraudulent misrepresentation and concealment. Count 3 alleges unfair competition by the plaintiff, based on the same fraud allegations as count 2. Counts 2 and 3 of the amended counterclaim have been tried, although the question of possible damages to defendant under these counts has been deferred for trial at a later date.

The issues to be decided at this juncture are (1) the validity of the patent No. 2,920,971, i.e., anticipation by the prior art, indefiniteness of the claims, inclusion in the claims of inoperative specie; (2) the fraud allegations and (3) infringement.

The Patent In Suit

The Stookey patent is directed to a method of producing ceramics by the devitrification (crystallization) of glass. This devitrified product has high mechanical strength, use-

[1] A trade name for a cooking vessel produced by Corning. This vessel is covered by the patent in suit.

[2] 15 U. S. C. A. § 2.

ful dielectric properties, and other properties which make it a desirable commercial product. There are 21 claims in the patent. Eleven are directed to the method of making the crystallized products and ten are directed to the resulting crystallized products.

In general, the patent first discusses the state of the art and then describes the theory and process to convert performed glass articles to crystalline ceramic bodies.

In discussing the state of the art, a distinction is made between the controlled hetrogeneous crystallization of the patent which results in a predominately crystalline product and the accidental and uncontrolled homogeneous crystallization which is encountered during the working of a glass. Homogeneous crystallization is undesirable as it forms coarse, nonuniform crystals which diminish the transparency and mechanical strength of the glass. Also discussed is a controlled crystallization commonly utilized for the production of light diffusing glasses, which is a form of homogeneous crystallization where the preliminary formation of nuclei is of the same composition as the crystals. Thus, only a limited amount of the total composition can be crystallized because of the small amount of crystallizable composition and the products remain glasses. The patent then discusses photosensitive glasses, which are not important here, and thereafter explains and distinguishes the Armistead patent[3] which is discussed infra.

The patent points out that a large variety of conventional glass making compositions containing TiO_2, after being formed into glass articles by conventional melting and glass forming operations, can be converted by a two-stage heat treatment to a crystalline ceramic body. The predominately crystalline ceramic is said to comprise a

[3] U. S. Patent No. 2,691,855 (hereinafter called the Armistead patent) application filed June 12, 1952, issued October 19, 1954 for high temperature thermometer tube and glass therefor.

multiplicity of very small interlocked crystals of the order of 0.1-20 microns in diameter and formed in situ from constituents of inorganic compounds in the glass other than the TiO_2. These crystals, formed during the heat treatment of the glass comprise at least 50% by weight of the product.

The patent teaches that TiO_2 is an effective nucleating agent, which causes the formation of submicroscopic nuclei in the glass during the first stage of the heat treatment. Upon heating the glass to a higher temperature, crystallization on these nuclei convert the glass to a crystalline product.

Typically, the product claims, 12-21, claim a ceramic body consisting essentially of a multiplicity of interlocked inorganic crystals dispersed in a glassy matrix, said crystals being on the order of 0.1-20 microns in diameter and constituting at least 50% of said body and formed by crystallization in situ from a glass consisting essentially of inorganic constitutents including 2-20% by weight of TiO_2, said glassy matrix consisting essentially of the uncrystallized portion of the glass remaining after crystallization of said crystals. Claim 21 defines these inorganic compounds of the glass composition as being at least 90% silica, alumina, titania and one or more of the basic metal oxides as defined in the patent. The titania content is defined as 2 to 20% by weight.

Claim 12 defines the product as above, except it does not specify the inorganic constituents of the glass or any titania content.

Claim 5 is representative of the method claims and defines a four-step method of making such predominately crystalline glass-ceramic products by a controlled crystallization. The four-steps are:

> "(1) melting a glass-making composition containing from 2-20% by weight of TiO_2, the ingredi-

ents Al_2O_3,SiO_2, plus at least one of the basic metal oxides from the group Li_2O, BeO, MgO, CaO, ZnO, SrO, CdO, BaO, PbO, MnO, FeO, CoO and NiO, with the SiO_2, Al_2O_3, TiO_2 plus basic metal oxides constituting at least 90% by weight of the glass making composition;

"(2) cooling this melt to form a glass;

"(3) exposing the glass to a temperature between the maximum nucleation temperature and the annealing temperature of the glass for a time of one minute to 100 hours;

"(4) and increasing the temperature of the glass to a temperature at which the glass making ingredients crystallize without melting, and holding the glass at this higher temperature until the product is 50% or more crystalline."

PRIOR ART

Whether the process or product of the instant patent is invalid for lack of invention and novelty over the prior art, because anticipated by it, must first be considered. The Court has concluded that both the method and product claims of the patent in suit are not anticipated by the prior art, and the invention disclosed in the patent is a basic and pioneering advance in glass and ceramic technology.

The major controversy revolves around the test codified by 35 U. S. C. A. 103 which provides that a patent may not be obtained "if the difference between the subject matter sought to be patented and the prior art (as defined in 35 U. S. C. A. 102)[4] are such that the subject matter as a whole

[4] 35 U. S. C. A. § 102 provides:

"A person shall be entitled to a patent unless—

(a) the invention was . . . patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

(b) the invention was patented or described in a printed publication in this or a foreign country . . ., more than one year prior to the date of the application for patent in the United States . . ."

would have been obvious at the time the invention was made to a person having ordinary skill in the art to which such subject matter pertains. . . ."

Prior to applying this test a summary of Anchor's efforts in this area is helpful in ascertaining "the state of the art." In 1957, Anchor became interested in the Corning crystallized product (pyroceram)[5] and at least by October 15, 1958, Anchor was attempting to determine how to make it: At that time, they had already chemically analyzed the composition of a Corning pyroceram. On May 7, 1959, Dillard, head of research and development for Anchor, reported to Fischer, chairman of the board of Anchor, that certain melts made by Anchor showed promise. Nevertheless, it was not like the pyroceram that Stookey had developed. Prior to reaching this stage in the development of its pyroceram program, Anchor had gleaned information that TiO_2 was the crucial nucleating agent in Corning's pyroceram from a disclosure in a Belgian trade magazine concerning Corning's copending application for a Belgian patent. Even with this knowledge it is doubtful that Anchor, whose research and development team were surely skilled in the art of glass technology, was able to develop a usable pyroceram until the Belgian patent was sent to them on September 26, 1959. Although the Anchor people had not studied the articles on which they rely as prior art, their inability to develop pyroceram quickly, especially since Anchor knew pyroceram's chemical composition and that 2-20% titania was used as a nucleating agent, indicates that the method of making pyroceram was not obvious to one skilled in the art.

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[5] A term adopted by Corning to describe the crystallized end product of the patent.

Of the patents and articles relied upon by the defendant to invalidate the patent, three[6] of the four[7] which defendant's expert testified were closest to the Stookey patent, were cited by the Patent Office. A presumption of validity attaches to a patent, 35 U. S. C. A. § 282, and greatly detracts from the weight to be given to prior art provided the Patent Office had such prior art before it.[8] Of the four, the one not cited by the Patent Office, the "Gambarian article" is not pertinent so as to destroy this presumption of validity.[9] Nevertheless, absent the presumption of validity, the prior art is inadequate to defeat the enforceability of the patent.

True, if one carefully selects various facts, methods and compositions from the above mentioned patents and articles, it is possible to construct the methods and compositions of the Stookey patent. However, such selection is not obvious to one skilled in the art except by hindsight.[10]

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[6] U. S. Patent No. 1,893,382, application filed June 16, 1930, issued Jan. 3, 1933, for a method of making cast basalt articles (hereinafter called the Watson patent); U. S. Patent No. 2,132,390, application filed July 3, 1935, issued Oct. 11, 1938 for diffusing glasses (hereinafter called the Blau patent); Armistead patent, *supra*, note 3.

[7] *Supra*, note 6; P. P. Gambarian, F. G. Arutiunian, and L. A. Rotiniants, Investigation of the Conditions of Crystallization of Melted Basalts, Collected Works of the Institute of Scientific Research of the People's Commissariat of Heavy Industry of the Armenian SSR, 1, p. 85, (1933) (hereinafter called the Gambarian article).

[8] E.g., Manville Boiler Co. v. Columbia Boiler Co. of Pottstown, 269 F. 2d 600 (4 Cir. 1959) cert. denied 361 U. S. 901 (1959); Georgia-Pacific Corp. v. United States Plywood Corp., 258 F. 2d 124 (2 Cir. 1958) cert. denied 358 U. S. 884 (1958); Hartford National Bank and Trust Co. v. E. F. Drew & Co., 237 F. 2d 594 (3 Cir. 1956).

[9] Cf: e.g., Hartford Nat. Bank & Trust Co. v. E. F. Drew & Co., 133 F. Supp. 648 (D. Del. 1955), aff'd. 237 F. 2d 594 (3 Cir. 1956).

[10] Compare Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp., 340 U. S. 147 (1950).

District Court Opinion

The Blau patent, which was cited by the Patent Office, describes the manufacture of a light diffusing glass known as floride opal glass. The untreated glass composition contains less than 3% of florides and does not contain any titania. The patent does disclose using a two-step heat treatment; the initial heating is to form nuclei and the second is to cause crystal growth upon the nuclei. The thrust of the patent is to produce crystals to opacify the glass. Nothing in the patent discloses that properties other than opacification will change or that a predominately crystalline body can be made. In fact, regardless of the length of the heat treatment, it is doubtful that a predominately crystalline body can be formed from the Blau composition, especially since the composition does not contain titania. Moreover, there is no teaching concerning the size or the interlocking of these crystals. Only small interlocked crystals, as claimed in the Stookey patent, create the desirable properties obtained by the patentee whereas large homogeneous or noninterlocked crystals are usually weak and undesirable. Also, even though Blau teaches a two-stage heat treatment, it is the reverse of Stookey's. Nuclei are formed at a high temperature and the crystal growth is developed at lower temperature, "e.g. not over about 1300° F."[11] (704°C.). On the other hand, Stookey uses a low nucleating temperature of approximately 820°C. and a high crystallizing temperature of approximately 1345°C.

The second patent involved, which was cited by the Patent Office, is the Armistead patent. This patent is directed to forming a white stripe directly behind the bore of a thermometer tube, which is then encased in a clear glass to make a high temperature thermometer. The opacifying agent in this stripe of glass is titania. The patent teaches that the titania is completely dissolved in the glass during melting and is reprecipated as a uniformly finely

[11] Blau patent, *supra*, note 6, p. 3, right column, line 44.

divided precipitate by subsequent heat treatment. The heat treatment consists of cooling the glass below its nucleation temperature and then reheating it above its nucleation point but below its liquidus to cause nuclei to grow by recrystallization. This treatment is only to cause opacification. True, if the glass was held at the recrystallization temperature long enough, a Stookey glass ceramic could be formed.[12] However, the patent itself does not disclose or suggest using a Stookey heat treatment, nor disclose or suggest that a glass ceramic could be made. Indeed, if a Stookey product had been made, it would have been unsatisfactory for thermometer tubing since it could not be drawn to make the tubing. Thus crystallization beyond the need of making an opacified product would have been avoided and been undesirable.[13] Moreover, the evidence shows that by following the teachings of the Armistead patent only 30.3% of crystals by weight would develop while the changes and properties which Stookey disclosed only begin to develop at 40% by weight crystallization.

The prior art, on which the defendant places its heaviest reliance, is the 1933 Watson patent, which relates to making cast basalt articles by fusing and casting volcanic rock by means of a special heat treatment. Watson teaches taking a basalt, melting it in a reducing atmosphere, casting it in molds in the desired shape, placing the molds in saggers

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[12] See text, *infra*, under heading of "Unclean Hands."

[13] Judge L. Hand reasoned much the same way in distinguishing an allegedly prior art patent in Dewey & Almy Chemical Co. v. Mimex Co., 124 F. 2d 986, 990 (2 Cir. 1942):

> Again, instead of directing practitioners of his method to mix gum and pigment, Newton told them to avoid gums; true, that was one way to do it, but a bad way, for gums "are liable to be washed out before the color is entirely set." Indeed, the whole purpose of the invention was "to remedy this"; so that, instead of prescribing the method that Miller [the inventor] employed to make a synthetic "bentonite", Newton pointed in directly the opposite direction.

containing a mixture of sand and graphite, heating it to 725° C. for approximately one hour and then reheating at 900° C. for one hour after which it is cooled to room temperature. Using this method, Watson points out that the recrystallization begins at the surface and proceeds to the center, but, nevertheless, a thin layer of vitreous material forms on the surface.

Watson also teaches that an oxidizing atmosphere can be used; however a two-step heat treatment cannot be used as the product would remain vitreous throughout the mass. Instead Watson teaches taking the melted basalt directly to 900° C., which will produce a devitrified product crystallizing from the center outward. The surface retains a vitreous skin.

Examining the first method, i.e., reducing atmosphere, which has the two-step heat treatment, it is apparent that the product which results is not the same as a glass ceramic. Crystallization by this method starts with the exterior whereas in Stookey the crystals form uniformly throughout the mass.

Watson's second method produces crystallization from the center outward; however, it is necessary to have an oxidizing atmosphere plus the fact that the two-stage heat treatment, if used, will produce only a vitreous product.

The patent does not suggest or teach that a new combination of properties can be had by its methods, nor does it suggest that small crystals, 0.1-20 microns in diameter, will be formed.[14] Most importantly, the patent leaves the choice

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[14] For an analogous situation see Newburgh Moire Co. v. Superior Moire Co., 237 F. 2d 283 (3 Cir. 1956). In that case, the attack on the patent's validity is very similar to the one at bar. The attackers used the same method of selecting parts of prior patents to argue anticipation. The Third Circuit Court of Appeals rejected this argument.

of a basalt to be used to any person attempting to follow the patent and there are thousands of them.[15] Thus, the composition of the original substance is not disclosed and does not guide anyone in preparing a Stookey composition. Furthermore, there is no inkling that a person could form a glass article containing titania and then use a two-stage heat treatment to form a glass ceramic.

In Watson the atmosphere used is critical, whereas in Stookey, the atmosphere is unimportant. In Stookey, on the other hand, the use of titania is one of the critical factors while Watson does not teach anything concerning it. In fact, if 5% titania is added to a melted basalt and the Watson two-stage heat treatment is followed, crystallization is inhibited rather than promoted.[16]

Unlike the previous three patents discussed—Watson, Armistead and Blau—which were cited by the Patent Office,

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[15] Many cases have refused to consider a patent or article as an anticipation if its teaching will sometimes succeed and sometimes fail, e.g., Dewey & Almy Chemical Co. v. Mimex Co., *supra*, note 13, however, this case need not rest on this ground specifically.

[16] DX-3, p. 5. This experiment was reported in a patent application by Dr. Cyrus Klingsberg of the Corning Glass Works, which application never reached fruition. The experiment illustrates that a person would not realize that titania was a crucial factor in making pyrocerams. For example, a person could not chemically analyze a basalt and by using a trial and error method of increasing and decreasing the amounts of the various constituents determine that titania was the crucial item in crystallizing the few crystallizable basalts. It should be noted, however, that the atmosphere, whether oxidizing, reducing or neutral, is not disclosed, thus it could also be argued that had a reducing atmosphere been used, the basalt would have crystallized. This would indicate that the atmosphere is critical to the operation and not the titania content, thus illustrating the difference between Watson and Stookey as stated in the text.

defendant also urges that various articles,[17] both foreign and domestic, which were not cited by the Patent Office, make obvious the production of a glass ceramic *a la* Stookey. The Court concurs with defendant's expert who testified that of the articles relied upon by defendant if the Russian article by Gambarian, et al., does not anticipate or make obvious Stookey's patent disclosure, no article renders Stookey's "invention" obvious under the test of 35 U. S. C. A. § 103. Moreover, defendant does not urge these other articles in its brief.

The Gambarian article is concerned with purely experimental work on different kinds of basalts. The article discusses heat treatment of basalts to form crystallized products; however, it does not describe the two-stage heat treatment of Stookey's nor do the same small crystals result. In a later article by Rotiniants,[18] who continued Gambarian's work and was a co-author of the Gambarian article, he pointed out that of the articles formed, those having the coarser crystals did not shatter on being struck, but the finer crystalline ones did. This indicates that a spontaneous crystallization took place and not the Stookey heterogeneous crystallization. The heterogeneous nucleation disclosed by Stookey forms small interlocked crystals which are much stronger than the coarse homogeneous

[17] Navias, Compositions and Properties of Some High-Titania Ceramics, 24 Journal of The American Ceramic Society, 148 (1941); Korovnichenko, The Basalts of the Volmovakni River as the Source of Petrurgical Raw Materials in the Don Basin (1941); Portevin, The Molten Basalt, Mem. Soc. Ing. Civils France 266 (1928); Bigot, Basic Glasses Industry (1923); Purdy and Krehbiel, Crystalline Glazes, Trans. American Ceramic Society (1907); De Reaumur, Art of Making a New Kind of Porcelain, Memoirs Royal Academy of Sciences Paris (1739); Gambarian et al, *supra*, footnote 7.

[18] Rotiniants, Experiment on the Casting and Annealing of Basalts in Sand Molds (Third Report) (undated).

crystals which had been commonly known and were formed in the Gambarian experiments. Moreover, the basalts used by Gambarian did not have 2-20% titania in their composition and, furthermore, the crystallization began at the edge of the product and did not occur uniformily throughout the mass. The Gambarian, et al., article was an invitation to do more experimentation concerning basalts and did not come near to revealing or suggesting either the Stookey heat treatment, the Stookey raw compositions, or the Stookey product.

Finally, the great commercial success of the patented products is entitled to some weight to prove invention.[19]

Corning has been highly successful in marketing articles of pyroceram. They have manufactured and sold over $10,000,000 worth of pyroceram radomes (nose cones for guided missiles) to the U. S. Government from 1956 to date because of pyrocerams unique properties. The government has also fabricated a deep sea diving vessel, the Benthos, of pyroceram because of its ability to withstand tremendous compressive forces. The most successful product in terms of sales dollars (over $100,000,000) is "Corning Ware", a cooking vessel which can withstand high thermal shock. It is true that various influences, advertising, market promotion, packaging, etc., had considerable effect on the sales record of "Corning Ware"; however, this does not entirely account for its commercial success. There is no question that pyroceram fulfilled a commercial need.

The patentability of Stookey's invention is further buttressed by the experiments reported in the next section since the Court has concluded that these experiments were honestly and accurately performed.

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[19] E.g., Hartford National Bank & Trust Co. v. E. F. Drew & Co., 237 F. 2d 594 (3 Cir. 1956); compare Philco Corp. v. Admiral Corp., 199 F. Supp. 797 (D. Del. 1961).

District Court Opinion

FRAUD

Defendant has alleged that plaintiff perpetrated a fraud on the Patent Office in order to obtain its patent on pyroceram. Not only does the defendant's argument on this point go to the enforceability of the patent but two of defendant's counterclaims also rest upon it. Defendant contends that fraudulent statements were submitted to the Patent Office by the plaintiff in three affidavits and the written arguments by plaintiff's solicitor. These allegedly false statements were used in attempting to distinguish the prior art.

Having found the plaintiff had an invention which was patentable over the prior art,[20] as a legal proposition, defendant's allegations of fraud must fail. Not only must the defendant establish that an intentional misrepresentation was made to the patent examiner, but also defendant must show that the misrepresentation was material, i.e., that the patent would not have issued but for the fraud.[21] Since the patentee was legally entitled to the patent, any misrepresentation directed to overcoming the prior art, assuming arguendo there were some, could not be material.

A recent Supreme Court case, Walker Process Equipment, Inc. v. Ford Machinery and Chemical Corp.,[22] which conclusively settled the issue that obtaining a patent by means of fraud upon the Patent Office can be the basis for an anti-trust suit, necessarily assumed that the intentional misrepresentations were a material factor in obtaining the

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[20] See text, *supra*, under heading "Prior Art".

[21] Corona Cord Tire Co. v. Dovan Chemical Corp., 276 U. S. 358 (1928); Baldwin-Lima-Hamilton Corp. v. Tatnall Meas. Systems Co., 169 F. Supp. 1 (E. D. Pa. 1958), aff'd. per curiam 268 F. 2d 395 (3 Cir. 1959), cert. denied 361 U. S. 894 (1959).

[22] No. 13—October Term, 1965. Sup. Ct. Dec. 6, 1965.

patent.[23] If one were entitled to a patent under the legal tests of patentability, there is no illegal monopoly resulting from the statements on which to base an anti-trust action. Consequently, the counterclaim based on fraudulently obtaining the patent in contravention of § 2 of the Sherman Act[24] fails. The common law fraud counterclaim fails for the same reason.[25]

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[23] Some of the language in the Walker case, *supra*, note 22, might seem to support the opposite conclusion. For instance the Court quotes from Precision Instrument Mfg. Co. v. Automotive Maintenance Machinery Co., 324 U. S. 806 (1945):

> "... The far-reaching social and economic consequences of a patent, therefore, give the public a paramount interest in seeing that patent monopolies spring from backgrounds free from fraud or other inequitable conduct and that such monopolies are kept within their legitimate scope."

however, the Court continues:

> "Walker's counterclaim alleged that Food Machinery *obtained* the patent by knowingly and willfully misrepresenting facts to the Patent Office. Proof of this assertion would be sufficient to strip Food Machinery of its exemption from the anti-trust laws." (Emphasis added)

This case did not explicitly consider the question of materiality although the court, by using the word "obtained" in the above quote, implies that the misrepresentations must be material. Statements made prior to the above quotes also imply materiality:

> "It must be remembered that we deal only with a special class of patents, in those procured by intentional fraud. ... To permit recovery of treble damages for the fraudulent procurement of the patent coupled with violations of § 2 accords with these long recognized principles."

The words, "procurement" and "procure" imply that the patent must issue because of the fraud, i.e., materiality. Moreover, this case arose under a motion to dismiss and the Court could not decide on a factual basis, as in the case at bar, that the misrepresentations were not material.

[24] 15 U. S. C. A. § 2.

[25] See Prosser on Torts § 89 (2nd Ed. 1955); Harper & James, The Law of Torts § 7.13 (1956).

District Court Opinion

Unclean Hands

Even though misrepresentations made to the Patent Office are not legally material to the issuance of a patent, nevertheless, this Court, being a court of equity, can and should refuse to enforce the patent if the Court finds the patentee made intentional misrepresentations to the patent examiner, i.e., if the patentee came into the court with unclean hands.[26] The proceeding before the patent examiner is ex parte and an examiner has no way, in many cases, to ascertain the truthfulness of the representations made to him. Necessarily he must rely on the good faith of the applicant. Absolute honesty and good faith disclosure is necessary.

One practical reason for this requirement is that when any intentional misrepresentations are made to the Patent Office, it makes the findings of the examiner suspect and destroys any presumption of validity, which attaches when the Patent Office issues a patent. Once intentional misrepresentations are involved, the court has the burden of determining whether or not the misrepresentations were relied upon by the examiner and whether, absent such reliance, the patent should have issued.[27] In effect, the Court is deprived of the benefit of the Patent Office's expertise in making the initial findings concerning patentability. Enforcing a patent in behalf of one who has made intentional misrepresentations to the Patent Office, irrespective of the merits of his patent application, might encourage an applicant to be dishonest in dealing with the

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[26] Precision Instrument Manufacturing Co. v. Automotive Maintenance Machinery Co., 324 U. S. 806 (1945).

[27] Not all intentional misrepresentations will prevent the enforcement of the patent, but the representations must be relevant and significant. For example, if a false answer is given to the patent examiner when he asks "How are you", surely a false answer will not prevent the enforcement of the patent. Less obvious examples can be postulated.

Patent Office, thus preventing the office from functioning properly.[28]

To successfully assert that intentional misrepresentations were made, the standard of proof to be met is not a preponderance of the evidence but the intentional misrepresentations must be proved to a reasonable degree of certainty, otherwise the defense of unclean hands cannot be upheld.[29]

Having examined the allegedly false statements, the Court concludes that the defendant has not met its burden in proving (1) any false or misleading statements were made, except the one representation made by plaintiff's solicitor to the patent examiner that basalts do not contain TiO_2, and (2) an intent to deceive the examiner. At most defendant's evidence establishes that the method of conducting the experiments reported in the affidavits might have been done more carefully or in a different manner. Ultimately, the testimony on this point resolves itself into a conflict of experts' opinions as to the best means of conducting the experiments. The affidavits attacked were filed by Dr. R. M. Witucki, Dr. Cyrus Klingsberg and Dr. H. D. Kivlighn and each with the accompanying argument by plaintiff's solicitor will be considered seriatim.

THE WITUCKI AFFIDAVIT

Before the Stookey application was filed with the Patent Office, Corning realized that the Armistead patent might be cited by the patent examiner as prior art. In anticipation of this event, Dr. R. M. Witucki was instructed to devise an experiment which would show that Armistead's

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[28] The Courts are not insensitive to economic coercive power which an invalid patent gives its holder. See Note, 112 U. Pa. L. Rev. 1169, 1170 (1964).

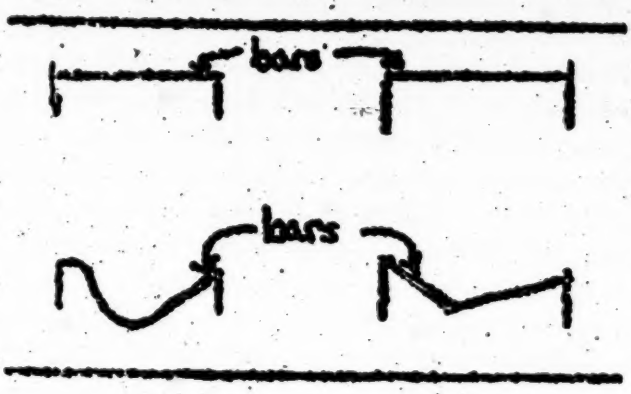
[29] Baldwin-Lima-Hamilton Corp. v. Tatnall Meas. Sys. Co., *supra*, note 21.

thermometer glass was different from the Stookey product. Dr. Witucki decided to heat treat both Armistead and Stookey compositions using the Stookey and Armistead methods. He then intended to give them a sag test, i.e., put them in a furnace across two knife edges about 6" apart and heat them for a period of time. Evidently Dr. Witucki equated crystallinity with nondeformability. Based on this premise Dr. Witucki reasoned that if a Stookey composition heat treated by the Stookey method did not sag and an Armistead composition heat treated by the Armistead method did, the test would show that both the Stookey composition and heat treatment were different from Armistead's. However, Dr. Witucki could not expect to prove that both Stookey's heat treatment and compositions were different from Armistead's since Armistead's untreated compositions were included within the compositions of Stookey's patent. At best, the experiment could only differentiate the heat treatments.

Witucki completed his experiments and filed a written report concerning them with the Corning patent office on September 28, 1956. In the meantime, Stookey's patent application was filed on June 4, 1956. In March 1957, Stookey's application was rejected by the Patent Office based on the Blau and Armistead patents. Witucki's affidavit, based on the previous experiments and report, was then filed with the Patent Office to distinguish the Armistead patent.

In the affidavit, Dr. Witucki stated that he took both an Armistead and a Stookey composition and subjected them to an Armistead heat treatment and also that he took the same compositions and subjected them to a Stookey heat treatment. He stated that he then took the four bars, put them across knife edges 6" apart and gave them a sag test by heating them at 1150° C. for 17 minutes. Both bars which were given the Armistead heat treatment sagged and

the ones given the Stookey heat treatment remained perfectly straight. The following is a copy of the diagram attached to Witucki's affidavit:



Defendant's first criticism of the Witucki affidavit is that the affidavit stated its purpose was to show a difference in kind rather than degree between Armistead and Stookey and the above test was completely unsuitable to either prove or disprove this point. Merely stating the proposition illustrates that this statement does not show any intentional misrepresentation. It is a matter of opinion as to what the result proved. The examiner, who is an expert, could draw his own conclusions when looking at the above diagram. If it did not show a difference in kind, he should have recognized it and rejected the application. Moreover, the Court is convinced that the above experiment shows that the Stookey heat treatment creates a highly crystalline product, which will not deform at the same temperature as a glass. There is ample information in the record that when a glass material crystallizes, it can be subjected to a much higher temperature without deforming than a glass of the same composition.

Secondly, defendant asserts that Witucki's statement—"that he studied the cycle of temperatures employed in the commercial production of thermometer tubing"—is misleading in that the statement implies that he, Witucki, studied an Armistead thermometer cycle and the cycle used in the affidavit was actually found to be in use. The implications of the affidavit are what the reader wishes to place there. The affidavit clearly states what Witucki did and does not need any interpretation. It does not say Witucki studied or observed Armistead thermometers actually being made.[30] Indeed, Dr. Witucki relied upon a report by Dr. Harrington of a commercial thermometer heat cycle, the only one then in production. However, Dr. Witucki personally observed the cycle to determine the accuracy of the report. After studying the Armistead patent the commercial cycle was adjusted upwards by 200° C. to approximate the Armistead cycle. Anchor's experts did not dispute that the time and temperatures actually used were accurate and, furthermore, Dr. Armistead, the inventor of the Armistead glass, testified that the time and temperature cycle used by Witucki was more conducive to making a Stookey glass ceramic than the one used in making an Armistead thermometer.

Defendants also complain that Dr. Witucki did not use the chemical compositions of Armistead Example 1 and Stookey Example 15 in his experiments as stated in his affidavit. Defendant relies on various notebook pages of Dr. Witucki to show that compositions which do not correspond to the examples were melted. True, Dr. Witucki's notebook discloses that incorrect compositions were melted in April 1956. These incorrect compositions were drawn

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[30] In fact, Corning only makes them once every few years so that observing an Armistead high temperature thermometer cycle would be impractical unless Armistead thermometers were being made at this time or a commercial run was specially set up.

into canes and subjected to tests. However, the Court does not agree with defendant's conclusion that these were the experiments recorded in the affidavit. At the bottom of these notebook pages is the notation that remelts were made in June 1956, which were subjected to later experiments. These remelts were of the correct composition, were cast in the form of bars and were designated by a prime mark, which prime mark is contained in all subsequent notations and experiments. In Dr. Witucki's summary report dated September 28, 1956, he specifically refers to bars of the composition which had been annealed and cut. The incorrect melts were canes, consequently the information for the affidavit must have been taken from Dr. Witucki's report of the later experiment using the remelts. Moreover, the affidavit follows the same procedure and uses the same wording of this report. Furthermore, Dr. Swan, Dr. Witucki's assistant, recorded in his notebook the same experiments recorded in the Witucki summary of September 1956, and which were reported in Witucki's affidavit. He also uses the primes on the glass compositions. Moreover, Dr. Witucki testified that in July and August when the affidavit experiments were run, he used the correct compositions.

Another criticism concerns the statement in the affidavit about the Armistead heat treatment in "that the glasses were thereby cooled so rapidly through the nucleation range that no substantial nucleation of and by TiO_2 occurred." Defendant contends this is contrary to the Armistead teachings. First, it should be pointed out, that this is a conclusory statement by Dr. Witucki which undoubtedly Dr. Witucki believed. Since at that time the nuclei were undetectable visually or by any other means, this conclusion by Dr. Witucki must have been drawn from the fact that a ceramic was not made. Secondly, the actual procedure for cooling the glass is stated in the affidavit. Thirdly, the Armistead patent does not give any instructions on

the cooling rate but only says "The nucleation temperature, that is, the temperature at which invisible nuclei of TiO_2 begin to form, is lower than the liquidus. Consequently, opacification is brought about by cooling the glass substantially below its nucleation temperature, generally below 1000°-1200° C., to form such invisible nuclei and thereafter reheating. . . ."[31] This is exactly what was done. The entire procedure was stated in the affidavit and the patent examiner was satisfied with it. He could draw his own conclusion.[32]

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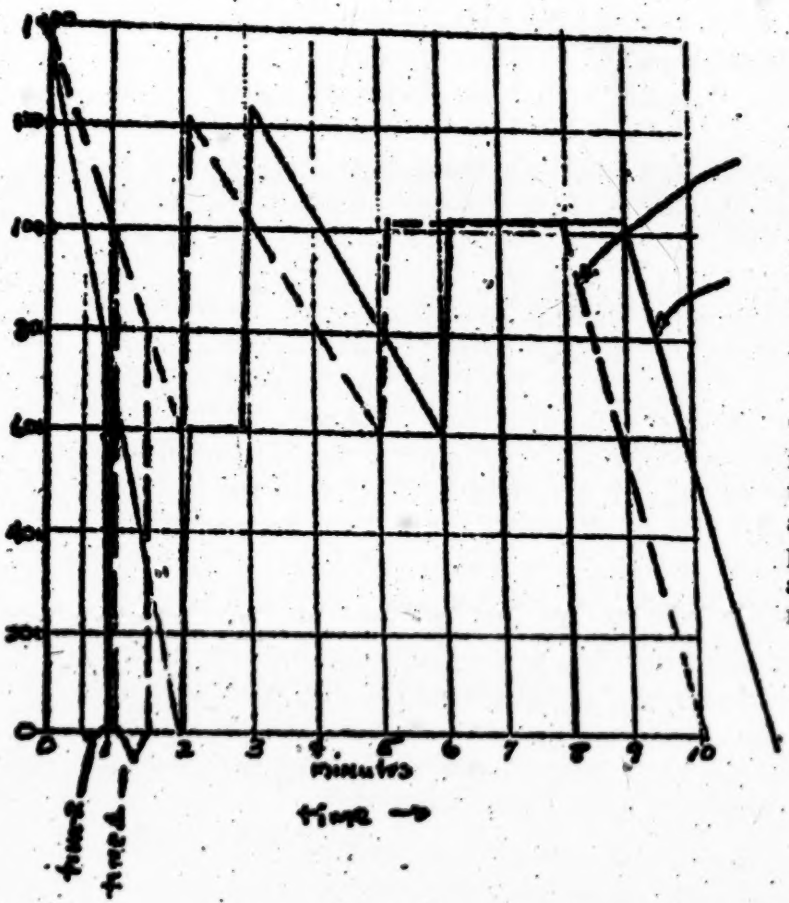
[31] Armistead patent, *supra*, note 3, Col. 3, lines 5-12.

[32] Incidentally, defendant could have criticized the Witucki experiment on the basis that it departed from the actual heat treatment of an Armistead thermometer glass. In the actual Armistead operation, the glass is not cooled to room temperature after being melted, but is cooled only to 600° C., the temperature of the clear glass boule to which it is applied. Assuming the times remained the same for the different operations, this would result in the Armistead thermometer glass remaining within the nucleating temperature range for a longer period of time than the glass in Dr. Witucki's experiment. A diagram of the heat-time cycle will illustrate the point.



As can be seen, on the cooling of the initial melt, assuming nucleation takes place between 800°-1000° C., under the Armistead thermometer heat cycle the glass would be in this range a little over 30 secs ($time_1$), while in Dr. Witucki's experiment the glass was within this range about half this amount of time ($time_2$). Nevertheless, defendant did not urge this as a significant deviation nor did the examiner attribute any significance to it. Moreover, the defendant did not submit any experimental evidence which would show that this difference was significant so this Court attaches no significance to this fact.

Finally, defendant argues that certain tests which Dr. Witucki conducted and certain words used in Dr. Witucki's summary report of September 28, 1956 were omitted from his affidavit. Dr. Witucki did apply sag tests to the bars at both 1100° C. and 1200° C. which were not included in his affidavit. At 1200° C., a Stookey heat treated bar as well as an Armistead heat treated bar sagged. No significance was attached to this test by Corning since it was assumed, justifiably so, that both bars were above their liquidus. It neither proved or disapproved anything. On conducting the sag test at 1100° C., an Armistead heat treated bar sagged in the first few minutes, but the continued heating during the test cerammed the bar and it did not continue to sag. This would indicate that the lengthy Stookey heat treatment was critical to making glass ceramics. Not reporting this test cannot be fraudulent for it would have helped to prove this point.

Reporting the 1150° C. test as diagramed, supra, was dramatic evidence of the uniqueness of the Stookey heat treatment, and the Court cannot conclude that by submitting its best test to prove its point Corning was acting fraudulently or making a misrepresentation.

As for omitting from the affidavit that Dr. Witucki used terms in his report[33] characterizing products resulting from using Armistead heat treatments on Armistead compositions as "apparently good ceramics" or "apparent ceramic which is fragile" is not blameworthy, especially in view of Dr. Witucki's conclusion on the first page of his report. He stated "It was found that the high temperature thermometer opal heat treatment does not develop good ceramic properties." Moreover, when the patentee's solicitor

[33] PX 122. Report by Dr. R. M. Witucki to the Corning Patent Department entitled "Effect of Heating Cycles on the High Temperature Deformation of a High Temperature Thermometer Opal Glass and on 607 BUZ.," Sept. 28, 1956.

represented to the examiner that the Armistead method produces a predominantly glassy body he was correct as a consideration of all the evidence shows.

THE KLINGSBERG AND KIVLIGHN AFFIDAVITS

After considering the various arguments made by patentee's solicitor and the Witucki affidavit, the patent examiner still rejected all of the patentee's claims based on (1) combining the Armistead patent with the newly cited Watson patent, and (2) on Watson alone. In order to show that by following the Watson patent a Stookey product was not obtained, Corning filed various affidavits, one of which was executed by Dr. Cyrus Klingsberg. Defendant has alleged that various misleading statements were made in this affidavit and the accompanying argument by patentee's solicitor. There is no doubt that misrepresentations, if any, in the affidavit were not material to the issuance of the patent. The patent examiner rejected the applicability of the affidavit on the grounds that the Watson method was not followed. However, as discussed previously, the Court is still forced to consider whether the Klingsberg affidavit contained any intentional misrepresentations.

The affidavit describes the various steps pursued by Dr. Klingsberg in attempting to follow the Watson patent. An analysis of the resulting product is included. After the patent examiner rejected the applicability of this affidavit, another affidavit (the Kivlighn Affidavit) was filed by Corning. In it, Dr. Kivlighn also recited experiments which purported to follow Watson's teachings and contained analyses of the resulting products. As defendant's allegations of intentional misrepresentations and omissions cover both affidavits and, in many cases, are identical criticisms, they will be discussed together.

Defendant's first point is that the affidavits imply that a representative basalt was used; but the actual basalt used

was atypical since it was low in TiO_2. Neither of the affidavits state that a certain or a representative basalt was used. The implication of the affidavit is what one wishes to draw. True, the basalt used was a Jefferson County, Colorado basalt, which, according to the experts, contains approximately 0.82 to 1.0% TiO_2. This is somewhat below the average TiO_2 content in basalts, however, there is no indication that Corning chose this basalt because of its low TiO_2 content. Moreover, Dr. Klingsberg, who holds a master's degree in geology, testified that when he performed the experiments and executed the affidavit, he thought the basalt was fairly representative. However, even if Doctors Klingsberg or Kivlighn knew that the basalt used was low in TiO_2 still they were within the teaching of the Watson patent since it does not state that a particular basalt or one with a certain chemical composition should be used. The choice was left to the one attempting to follow it. On these facts, the Court cannot conclude that the use of the Jefferson County, Colorado, basalt was wrong.

Defendant's second allegation is that both Klingsberg and Kivlighn melted the basalts for an excessive period of time. Klingsberg melted the basalt for 7 hours, Kivlighn for 16 hours. Granting that the basalts would melt within 3 hours, provided the basalt sample is not extremely large, and that excess heat would tend to interfere with subsequent crystallization, again there is no evidence that either of these scientists intended to prevent crystallization by this means or even that they knew that excess heat would interfere with crystallization. Dr. Kivlighn testified it was standard at Corning to melt items overnight. Logically, he followed this procedure. Moreover, the Watson patent did not suggest that excess heat would interfere with the development of its product. The person following the patent had his choice of melting time.

Defendant contests the so-called assumption in both affidavits that the melts were made in a reducing atmosphere,

which Watson teaches is critical. Both Klingsberg and Kivlighn used electric and not gas fired furnaces so an Orsat analysis could not be made of the flue gas. Consequently, neither scientist ran any tests to determine whether they had a reducing atmosphere. However, both scientists correctly assumed they did. The crucible in which the basalt was melted was placed inside another crucible which contained graphite. Since no air was added to the furnace, the carbon in the graphite would combine with the oxygen in the air to form carbon monoxide, which would normally create a reducing atmosphere. Additionally, the entire procedure was disclosed to the examiner in the affidavits.

Defendant takes exception to the Klingsberg affidavit asserting that the reported visual and X-ray examination of the samples were inadequate to determine whether the product was crystallized. The Court has examined well crystallized and vitreous basalts and is satisfied that a crystal product can be visually distinguished from a glass one. Also Corning did conduct X-ray diffraction tests on these samples to see if they were crystalline. These X-ray diffraction tests were accurate enough to tell whether an object was well crystallized or all glass. There was nothing misleading about the report of these tests and, at that time, they were the most reliable tests known, as plaintiff's patent solicitor represented to the patent examiner.

Defendant's final criticism of the Klingsberg affidavit is that Klingsberg only reported the results from 5 out of 8 samples treated. However, the three samples not discussed in the affidavit were treated at 950°-1000° C., which heat treatment was not taught by Watson. There was no reason to include them. Furthermore, defendant attempts to draw the implication that these unreported samples were well crystallized but there is no evidence that they were more crystalline than the others.

Finally, defendant attacks the Kivlighn affidavit in that the records underlying the affidavit show substantial crys-

tallization of the Watson product while the affidavit itself implies a small amount of crystals. It is obvious that the underlying records support the affidavit and no further discussion of it is warranted.

Having considered the affidavits and the points raised by the defendant, the Court concludes that the affidavits were neither intentionally misleading nor misleading at all. Nevertheless, one bothersome point remains and that is the representation by plaintiff's patent solicitor to the patent examiner that basalts do not contain TiO_2. Undoubtedly, this statement is false since all basalts contain some TiO_2. However, the evidence indicates that the statement was innocently made.[34]

The statement appears in a written argument made to the patent examiner in connection with the amendment accompanying the Klingsberg affidavit. The context in which the statement was made is a recapitulation of an interview between the solicitor and the patent examiner. If the statement were made with fraudulent intent during an oral interview of which there is no record, surely the solicitor would not include it in a written record. This is especially true since in his written argument he disavows that he is relying on the TiO_2 content of basalts. Moreover, Corning had a patent application written by the same solicitor pending before the same examiner at this same time. This application explicitly stated that TiO_2 was present in basalts. It is impossible for this Court to conclude that an attorney, especially one familiar with patent application procedures, would have made such contradictory statements which were readily apparent and subject to the scrutiny of the same

[34] The issuance of a patent upon the basis of an innocent misrepresentation of fact in the Patent Office serves only to destroy the presumption of validity of the patent. Huston v. Buckeye Bait Corp., 145 F. Supp. 600 (S. D. Ohio 1955), affirmed 237 F. 2d 920 (6 Cir. 1956). However, this assumes that the innocent misrepresentation had a substantial bearing on the issuance of the patent.

patent examiner, unless innocently made. Also, this statement was made in relation to three claims, two of which were immediately rejected and the third cancelled. The examiner could not have relied on it and consequently the presumption of the validity of the patent remains.[35]

In summary, the Court concludes that the doctrine of unclean hands is not applicable to the facts of this case.

INOPERATIVENESS

Defendant has attacked the patent on the grounds that the patent claims are too broad in that they cover "inoperative compositions." The law is clear that a patent claim is unenforceable which, under a reasonable construction of the claim, asserts a monopoly broader than the invention.[36]

The attack only goes to the method claims since the product claims describe a result. Nothing could be inoperative but the means to reach the desired end product. The defendant has not established that inoperative compositions are included within the method claims. Defendant did not offer any proof at trial concerning any compositions that were inoperative. Instead, defendant attempted to rely on Corning's reports which covered various experiments done by Corning in developing commercial pyroceram products. Howover, none of these reports satisfactorily establish that compositions within claim 1, the broadest method claim, are inoperative. Some of the compositions were not glass making compositions as required by the method claims; some were abandoned because they were not considered the best or cheapest commercial products; and others were discarded with the intent

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[35] See footnote 34, *supra*.

[36] E.g., Lincoln Engineering Co. v. Stewart-Warner Corp., 303 U. S. 545 (1938); Patrol Valve Co. v. Robertshaw-Fulton Controls Co., 210 F. 2d 146 (6 Cir. 1954).

to investigate them further at a later time. A conclusion of inoperativeness cannot be reached based on these assertions. Since defendant has failed to make even a prima facie showing of inoperativeness, the Court has not considered each assertion separately.

INDEFINITENESS AND VAGUENESS

Defendant attacks the patent in issue because of the vagueness of the claims since they require independent experimentation to determine (1) whether a given glass formula will make a pyroceram, (2) the size of the resulting crystals and whether they interlock, and (3) percent crystallinity. However, prior to considering these assertions, a preliminary issue—whether the 50% crystalline criteria is definite within the meaning of 35 U. S. C. A. § 112—must be decided.

The claim language itself, 50% crystalline, is definite; thus the holding of many of the cases cited by defendant[37] is inapplicable. In those cases, the courts were concerned with the inexact word descriptions of the claims. Here, the 50% limitation is an exact description; however, the alleged ambiguity arises because there is no way to accurately measure the percent crystallinity of the end product, a measurement required by all the claims in the patent.

At the time of the patent application, 1956, the margin of error in determining percent crystallinity of a particular glass ceramic by X-ray diffraction, the test procedure described in the patent, was in the range of from 7 to 10%. Thus if it is determined that a product was 50% crystalline, in actuality the crystallinity could vary between 40% and 60%, if the outer limit of the margin of error is used.

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[37] E.g., United Carbon Co. v. Binney & Smith Co., 317 U. S. 228 (1942); General Electric Co. v. Wabash Appliance Corp., 304 U. S. 364 (1938); Fruit Treating Corp. v. Food Machinery Corp., 112 F. 2d 119 (5 Cir. 1940), cert. denied 311 U. S. 679 (1940).

Based on this margin of error, Anchor argues that the limits of the patent are indefinite by the standards of 35 U. S. C. A. § 112. The defendant asserts that the state of the art at the time of the application is the touchstone to be used in defining the descriptions and tests in the patent. Otherwise, it can be argued, the scope and limitations of the patent monopoly would vary as tests and meanings change and the learning in the field becomes more sophisticated.[38] On the other hand, the plaintiff argues that the time of the issuance of the patent should be controlling. The measurement of the limits is to inform the public when it is transgressing on the patent monopoly. Consequently, since the patent application is confidential until issuance, the public has no way or reason to determine if they are infringing the patent until it issues. Thus, the plaintiff asserts this date is the critical time to determine the definiteness of the patent.[39] It is unnecessary to resolve this issue because the same 7 to 10% error existed at the time the patent issued.

Still to be resolved is the issue whether this 7 to 10% margin of error in determining percent crystallinity is so great as to make the patent claims indefinite within 35 U. S. C. A. § 112. The purpose of the indefiniteness doctrine was explained by the Supreme Court:

> "The limits of a patent must be known for the protection of the patentee, the encouragement of the inventive genius of others, and the assurance that the subject of the patent will be dedicated ultimately to the public."[40]

Considering the first purpose given for the definiteness of the claims, i.e., the protection of the patentee, the margin of error found here should not invalidate the patent. If the

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[38] Defendant cites as authority for its position Raybestos-Manhattan, Inc. v. Texon, Inc., 268 F. 2d 839 (1 Cir. 1959).

[39] Plaintiff cites for its position Helene Curtis Industries v. Sales Affiliates, 233 F. 2d 148 (2 Cir. 1956), cert. denied 352 U. S. 879 (1956).

[40] General Electric Co. v. Wabash Appliance Corp., 304 U. S. 364, 369 (1938).

patentee defines his invention by the use of limits which are subject to a certain margin of error in measurement, the patentee cannot expect protection within this margin. Whenever the measurement of the product produced by competition falls within this range of error in measurement, there would not be infringement. In the instant case, if a competitor produced a product which, on measurement by X-ray diffraction showed 59% crystallinity, it would be entitled to a judgment of noninfringement because within the limits of measurement preciseness of 10% error it is possible that the competitor's product is only 49% crystalline; consequently it falls outside the claim limits of the patent. Thus the patentee is protected although his protection may be more limited than he desires.

This interpretation does not run afoul of the second purpose of the indefiniteness doctrine for a competitor can experiment freely within this area of measurement error without fear of infringing the patent. Moreover, the third purpose is upheld since no one can obtain a patent within the patent claims because it has already been publicly disclosed. Ultimately the public will get the benefit of a public dedication of the actual area covered by the patent monopoly.

Interpreting claims as narrowly as possible when considering the patentee's protection, i.e., at the limits which gives the patentee the smallest monopoly and interpreting them broadly when considering the public dedication of the patent not only upholds the policy of the indefiniteness doctrine when considering measurement error, but also serves the purpose of not invalidating every patent litigated in which measurement is important. Otherwise, every such patent could be invalidated because every measurement technique has some margin of error.[41]

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[41] This Court does not mean to intimate that all measurement errors can be handled in this manner; but only in an uncrowded field where the measurements are not critical in distinguishing the prior art. Moreover, the error could be so large as to be no measurement at all, for example, a 50% error.

Defendant also has argued that the 50% limit is meaningless because there is no sharp cleavage at 50% crystallinity between desirable and undesirable products. The change in properties begins at approximately 40% crystallinity and in most cases is complete at 60%. Because the change begins at 40% plaintiff could have claimed all products of 40% crystallinity and upwards; but a patentee is under no duty to claim to the ultimate limits of his invention. He can surrender part of his invention to the public.

However, the patent is unenforceable because in 1956, when the application was made, and in 1960, when the patent issued, to determine the percent crystallinity within this 7 to 10% margin of error required costly and lengthy independent experimentation to devise a test to ascertain whether a product was within the bounds of the patent claims. Even though the Patent Office did not require the 50% limitation in the patent, the patentee included this limitation and relied upon it to distinguish his patent from the prior art. Consequently, the public is entitled to experiment in this glass ceramic area and related fields up to the 50% crystallinity without being compelled to independently experiment to determine the limits of the patent claims. The Third Circuit established the controlling guideline in Standard Oil Co. of California v. Tide Water Associated Oil Co.,[42] when it stated:

> "The most immediate test of sufficiency of precision in description following from the policy just outlined is that no inventor may compel independent experimentation by others to ascertain the bounds of his claims."[43]

This test is applicable here. A patentee cannot foist a great financial burden on another to develop a new measure-

[42] 154 F. 2d 579 (3 Cir. 1946).

[43] 154 F. 2d at 582-583.

ment technique to determine whether he is infringing the patent. This is part of the burden and expense which the patentee must bear in order to obtain a patent monopoly.

The patent in suit states that the percent crystallinity could be determined by X-ray diffraction, the only test described. However, Corning at the time of its patent application, had not measured any of the various examples in its patent for percent crystallinity and Corning's witnesses admitted that it would take too long and be too difficult to measure the examples for percent crystallinity.

In 1956 two weeks before the patent application, Corning's records show that it was impossible to determine percent crystallinity by X-ray diffraction. In 1958 Corning was still unable to determine percent crystallinity of a glass ceramic by either X-ray diffraction or electron microscopy, although it was possible to determine this percentage roughly by chemical analysis.[44] Finally, by 1964, with the help of new techniques which were developed after a year of independent experimentation, Corning's experts were able to make an estimate of the crystallinity in the glass ceramics within a 4 to 5% range of error. A description of this new technique was first published in 1964, about eight years from the time of the patent application and four years after it was issued.

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[44] This Court does not mean that the best way of determining the limits of the claims must be set forth in the patent; however, the test set forth must be reasonably certain to distinguish patented and unpatented products. As Judge Kirkpatrick has stated:

> "All that is necessary is that the patentee make as full disclosure as he reasonably can and that he describe the product with sufficient particularity that it can be identified and that those who are interested in its manufacture are enabled to determine what will and what will not infringe."

Benger Laboratories, Limited v. R. K. Laros Company, 209 F. Supp. 639, 642 (E. D. Pa. 1962), affirmed per curiam, 317 F. 2d 455 (3 Cir. 1963), cert. denied 375 U. S. 833 (1963).

District Court Opinion

Between the time the patent issued and the sale of its commercial products, Anchor spent a great deal of time and money trying to measure the percent crystallinity in its proposed commercial products. Anchor spent over $100,000 to determine the percent crystallinity; however, this includes the cost of an X-ray machine and the cost of training personnel to operate it. The training and equipment costs are irrelevant for a patentee does not have to pay the cost of teaching competitors to use measurement equipment or buy it. But, it cannot foist upon them the cost of developing a technique, which is not commonly known or available. Furthermore, Anchor had to obtain the help of four independent research sources[45] to devise test methods before being able to determine percent crystallinity within the 7 to 10% range of error. For this reason, the patent must be held invalid and it is unnecessary to consider whether the claims require experimentation (1) to determine whether a given glass formula will make a pyroceram, and (2) to determine the size of the resulting crystals and whether they interlock. Having reached this decision the problem of infringement need not be considered.

The foregoing opinion is adopted as the Court's findings of fact and conclusions of law pursuant to F. R. Civ. P. 52 (a), 28 U. S. C. A.

Submit order.

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[45] Battelle Memorial Institute at Columbus, Ohio, Mellon Institute at Pittsburgh, Pa., Pennsylvania State University at State College, Pa., and Radio Corporation of America at Camden, N. J.

Appendix to District Court Opinion

This Court has considered the recent Supreme Court cases[1] concerning patentability. Inasmuch as these cases reaffirmed the tests applied in the present case, no change in this opinion is necessary.

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[1] Graham et al. v. John Deere Co. of Kansas City et al., No. 11—October Term 1965 (U. S. Feb. 21, 1966); Calmar, Inc. v. Cook Chemical Co., No. 37—October Term 1965 (U. S. Feb. 21, 1966); Colgate-Palmolive Co. v. Cook Chemical Co., No. 43—October Term 1965 (U. S. Feb. 21, 1966); United States v. Adams et al., No. 55—October Term 1965 (U. S. Feb. 21, 1966).

AUG 11 1967

JOHN F. DAVIS, CLERK

IN THE

Supreme Court of the United States

October Term, 1967.

No. 249.

ANCHOR HOCKING GLASS CORPORATION,
Petitioner,

v.

CORNING GLASS WORKS.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Third Circuit.

PETITIONER'S REPLY MEMORANDUM.

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ANCHOR HOCKING GLASS CORPORATION,
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ON PETITION FOR A WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
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PETITIONER'S REPLY MEMORANDUM.

In compliance with the spirit of this Court's new Rule 24(4), which becomes effective on October 2, 1967, the present reply memorandum is "addressed to arguments first raised" in the brief in opposition, viz., the misstatements of fact and the omissions of fact in Corning's brief in opposition.

But it seems appropriate to note that we are seeking review in this case, not to expend the time of this Court for resolution of a factual patent controversy, but because the decision below has jettisoned and disregarded fundamental legal doctrines that were early formulated here, and that have been consistently enforced ever since in an effort to prevent patents from cloaking improper monopolies. Corning's brief in opposition avoids a forthright discussion of these legal doctrines by confining itself to non-existent factual issues which for the most part are contrary to the concurrent findings of the courts below.

Accordingly, we are filing this reply memorandum. We are briefly calling attention to the legal doctrines and applicable findings of facts on which our petition rests.

1. *File Wrapper Estoppel.* Corning's wholly argumentative "Statement of the Case" (Br. Op. 2-7) is notably silent concerning its own activity in the Patent Office. Contrariwise, we set out (Pet. 7-11) the application history of the patent in suit, showing in detail how this alleged "pioneer" invention was rejected four times in the Patent Office as unpatentable over the prior art, amended six times by Corning, supported by *ex parte* affidavits, and buttressed by four personal interviews with the examiner.

We showed further that Corning met the examiner's second rejection by employing the examiner's former but then retired superior, who recommended that all the claims should require the presence of at least 50% crystals to overcome the rejection (487b-491b). An amendment limiting all claims in this manner and urging that this limitation distinguished the claims from the prior art, was then prepared and filed (318b-329b; 324b, 325b, 327b).

That amendment was followed up by two steps, first by a meeting between Corning's patent solicitor, the examiner, and the examiner's former superior now acting as Corning's consultant (237b, 239b-240b), and second by a post-interview supplementary amendment in which Corning again stressed 50% crystallinity as the distinguishing feature between the claims and the prior art (330b-332b).

We pause to note that, notwithstanding the documented facts just set forth, Corning nonetheless insists that our original reference to the "personal intervention of a retired former immediate superior of the examiner" (Question 2, Pet. 2) is "wholly unsupported by the record" (Br. Op. 2).

We further pause to note that, in the face of our detailed citations at Pet. 8, Corning's further assertion (Br. Op. 5) that "Petitioner nowhere explains wherein the concrete claim limitation 'at least 50%' of crystals was, or is, required to distinguish from the prior art" is quite without foundation.

In short, without repeating what we have already documented in great detail at Pet. 7-11, it is the fact that the

application history of the present patent proves beyond possibility of factual contradiction what we have already argued (Pet. 14), namely

> "after Corning's application had been twice rejected as unpatentable over the prior art, it amended its claims to assert that the product was at least 50% crystalline, and it argued that this limitation distinguished its claims from the prior art cited by the examiner."

Once the patent was issued, however, Corning changed its tune; the limitation that was urged on the Patent Office as crucial was represented to the District Court as merely incidental; the inventor testified as a witness in court that the 50% limitation was unimportant (33b-34b, quoted in part by the court below, Pet. App. A9-A10).

The District Court held Corning to its Patent Office position (44a; 276b; Br. Op. B33), saying,

> "Even though the Patent Office did not require the 50% limitation in the patent, the patentee included this limitation and relied upon it to distinguish his patent from the prior art."

But the court below, ignoring Corning's Patent Office position and relying instead on its contrary post-Patent Office *pendente lite* position, said (Pet. App. A9) that "In interpreting the claims and specifications the District Court relied too heavily on the 50% crystallinity standard set forth in the patent."

Thus, very plainly, the District Court applied the doctrine of file wrapper estoppel, while the court below brushed it aside. Yet, as said in a case relied on by Corning (Br. Op. 2), *Smith v. Snow,* 294 U. S. 1, 14-15, "It is a familiar rule that a patentee cannot broaden his claim by dropping from it an element he was compelled to add in order to secure his patent." And only very recently this Court reiterated that well-established rule in *Graham v. John Deere Co.,* 383 U. S. 1, 33, saying "claims that have been

narrowed in order to obtain the issuance of a patent by distinguishing the prior art cannot be sustained to cover that which was previously by limitation eliminated from the patent."

Yet Corning now represents to this Court (Br. Op. 7) that "neither the District Court nor the Court of Appeals found any file wrapper estoppel in this case. No estoppel is spelled out by the history of the prosecution of the patent in suit, nor required by the prior art."

How Corning can make such assertions in the face of the voluminous materials that we have only very briefly summarized above is not for us to say.[1]

2. *Indefiniteness.* The District Court's holding that Corning's patent was void for indefiniteness because it failed to meet the requirements of 35 U. S. C. § 112 (quoted at Pet. 3)—see, for its findings in detail, 41a-46a; 273b-278b; Br. Op. B30-B35—is attacked by Corning with an argument that "as a pioneer patent it should be accorded a liberality of construction" (Br. Op. 2)—citing portions of decisions discussing the issue of infringement, not validity. It is strange indeed that Corning should rely on such inapposite decisions to support the novel legal principle upon which the decision of the court below must stand or fall—that 35 U. S. C. § 112 has two standards of definiteness for patent claims, the conventional one established by this Court and a new lower standard devised for the

1. Corning's further contention that our reference (Pet. 2, Question 2) to "Affidavits of questionable accuracy" is "wholly unsupported by the record" (Br. Op. 2) founders on the circumstances that the District Court adverted at length in its opinion to obvious ambiguities in and omissions from three of the affidavits (Witucki's, see 31a, 33a note 32; 263b, 265b note 32; Br. Op. B19, B20, B22 note 32; Klingsberg's and Kivlighn's, see 37a; 269b; Br. Op. B26); and it also pointed out that, in respect of one representation by Corning's patent solicitor, "Undoubtedly, this statement is false" (39a; 271b; Br. Op. B28).

On this record, therefore, our reference (Pet. 2) to "affidavits of questionable accuracy" errs if at all on the side of understatement.

first time by the court below for so-called "pioneer" patents (Pet. 13, 17-18).

There is no occasion at this juncture to repeat our demonstration, see Pet. 15-17, that the present Stookey patent does not fall within the "pioneer" category as defined by this Court. All that is necessary here is to point out that 35 U. S. C. § 112 is concerned, not with the infringement of valid claims, but with the invalidity of claims couched in vague and indefinite language.

Not only does Corning fail to cite a single decision to support the peculiar dual standard of definiteness injected into 35 U. S. C. § 112 by the court below, but all the decisions of this Court are squarely the other way (Pet. 17-18). Indeed, one of the authorities cited by Corning (Br. Op. 2) supports our position. See *Eibel Co. v. Paper Co.*, 261 U. S. 45, 65: "Indefiniteness is objectionable, because the patent does not disclose to the public how the discovery, if there is one, can be made useful, and how its infringement may be avoided."

As the District Court found (41a-46a; 273b-278b; Br. Op. B30-B35; see also quotation at Pet. 11-12, 18) it was not possible except by "costly and lengthy independent experimentation to ascertain" how its infringement may be avoided. Corning makes a broadside attack on those findings (Br. Op. 6); but the record shows and the District Court found that Corning's own scientists were unable (e.g., 73b-74b, 216b-217b, 486b, Pet. 11-12) to make the crystallinity measurements it now so airily asserts to have been easy. These scientists (including the patentee in suit) testified that it would take 50 years to measure the percent crystallinity of the patent examples alone and when two of them tried to measure the crystallinity of Anchor's accused product shortly before trial, one of them found this product contained 40% crystals whereas the other reported the *same* product contained 66% crystals (Pet. 12-13 note 4, giving detailed record references).

But there is no occasion now to marshal all the evidence in support of the District Court's findings, because the court below proceeded on the ground that "the District Court erred * * * since the standards placed upon this particular patent were, as a matter of law, too strict" (Pet. App. A6). Thus we are dealing with "a matter of law"—not a dispute of facts.

3. *Corning Ware.* Corning (Br. Op. 3) suggests that its CORNING WARE formulation "is very similar to and a refinement of patent example 1", but it never asserts squarely that the present patent created CORNING WARE—and indeed its admissions at trial destroy any such contentions. Its president conceded at trial that both the CORNING WARE formulation and its heat treatment rested on many later patents and other developments by a large group of individuals (A468-469b; A44-45b DX-7). And Dr. Stookey testified to the same effect (A5b; Trial Transcript 270-81, not printed).

The limitedless claims of this patent unquestionably embrace CORNING WARE—and numerous other products not yet discovered—but the patent fails to *teach* how to make any of these products. This patent is merely an invitation to experiment in a boundless and uncharted area, with the successful experiments pre-empted by Corning and the failures charged against the experimentors.

CONCLUSION.

The basic questions presented by this petition are two: First, whether the court below was justified in rejecting the doctrine of file wrapper estoppel, thus sanctifying the course of conduct whereby Corning after successfully persuading the Patent Office that the limitation of 50% crystallinity was important, to distinguish the claims from the prior art, immediately thereafter persuaded the court below—with equal success—that the limitation was unimportant. Second, whether 35 U. S. C. § 112 now has two stand-

ards of definiteness for patent claims, instead of the one established by this Court and consistently applied by lower courts until the decision below.

Together these two questions add up to a patent case of genuine public importance, because, if the decision below is permitted to stand, prospective patentees will be mightily encouraged to play fast and loose with the Patent Office. This is a particular danger when coupled, as here, with a further holding that expands the patent so that its limits become unclear—especially in an industry that in the past, as this Court's files bear witness, has been plagued with unconscionable restraints of trade imposed by economically powerful business units.

We accordingly believe that this is a case calling for review by this Court.

Respectfully submitted,

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